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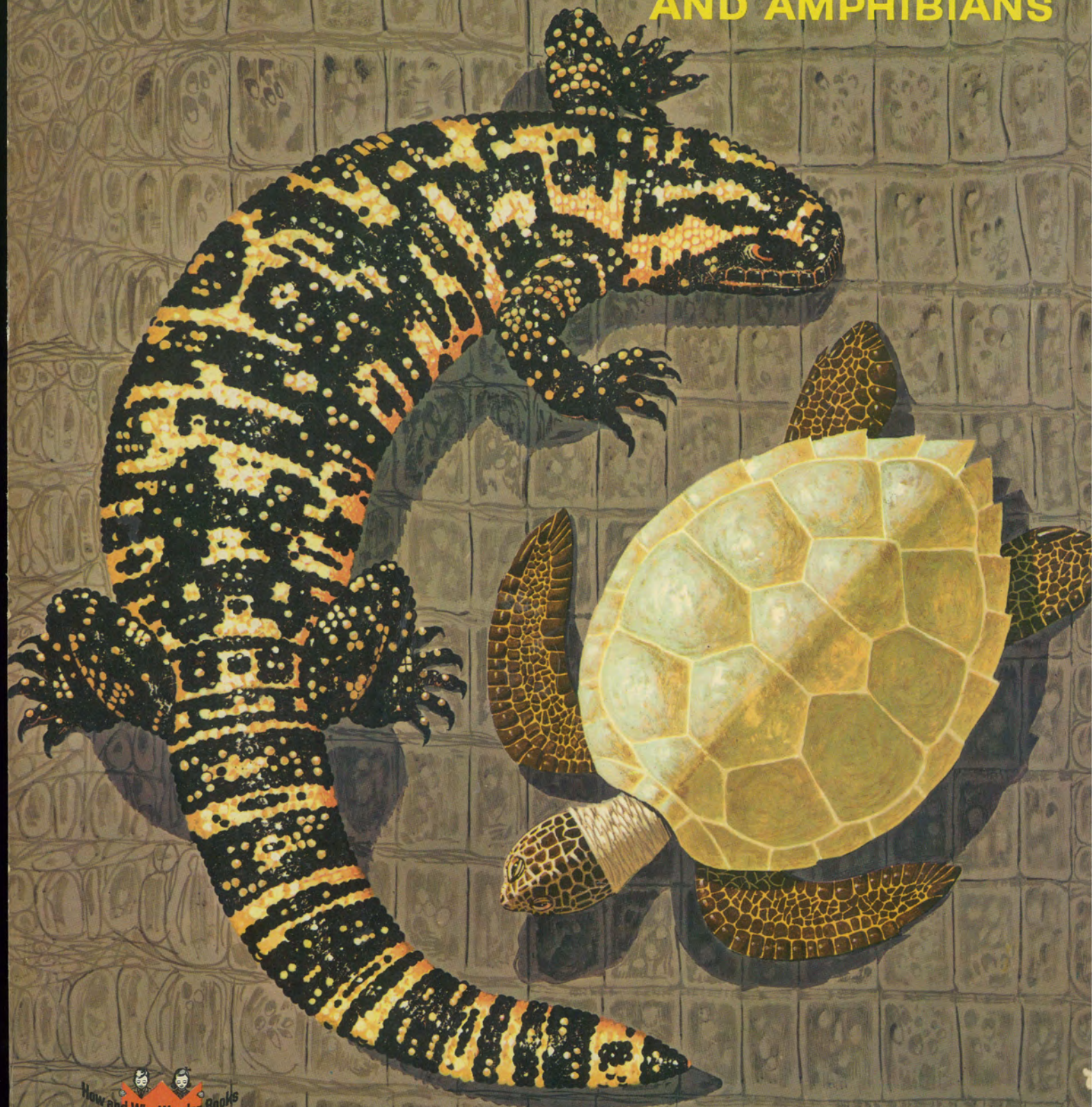
**HOW
AND
WHY**

Wonder Book of

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REPTILES

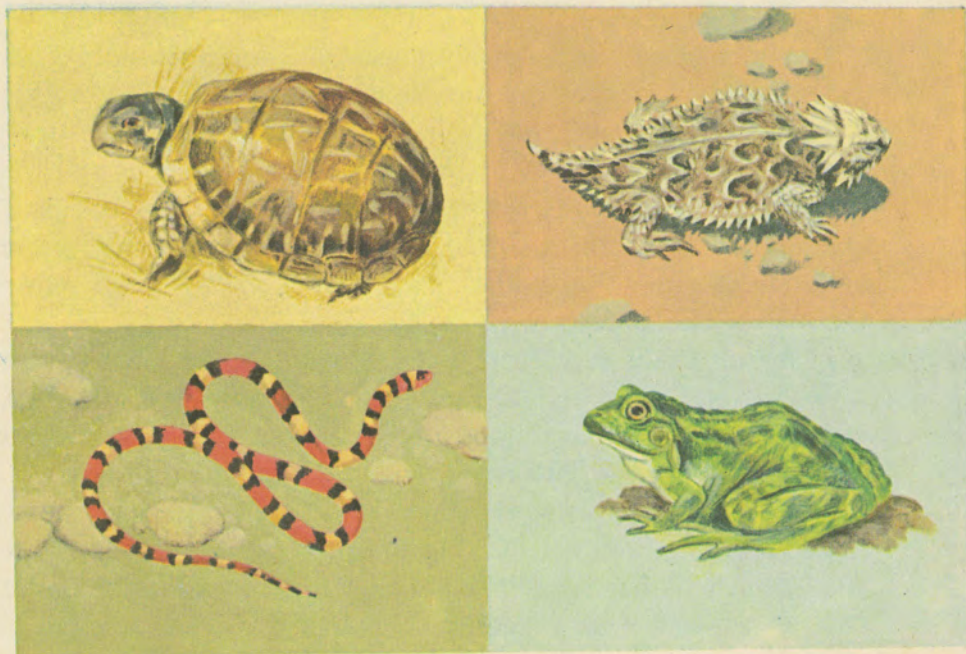
AND AMPHIBIANS



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THE HOW AND WHY WONDER BOOK OF
REPTILES
AND AMPHIBIANS

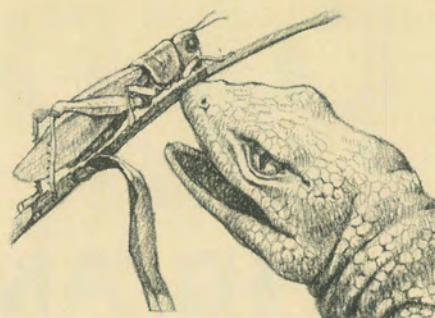
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Introduction

There are five large groups of backboned animals on earth today. They are the amphibians, birds, fishes, reptiles and mammals. This *How and Why Wonder Book* deals with two of these groups — amphibians and reptiles.

Which snakes are poisonous and which ones are not? This seems to be an endlessly interesting question to most people. Equally interesting are the fantastic superstitions and misbeliefs about snakes. This book deals with both of these topics. It tells which snakes are poisonous and which ones are not. It tells about many of the common superstitions and provides correct information about them. In addition, it tells many other interesting things about amphibians and reptiles, such as their eating habits, how they protect themselves and how they move.

In the Space Age there is no lesser need for people with knowledge about all plant and animal life. This interesting and informative book on reptiles and amphibians may stimulate a potential young scientist to select *herpetology* (the study of reptiles) as his major field of interest.

Youthful herpetologists who wish to learn about the habits of reptiles by close observation will be glad to know that several of the reptiles make good pets. This *How and Why Wonder Book* tells which ones may easily be kept as pets and gives suggestions for collecting and keeping them.

Paul E. Blackwood

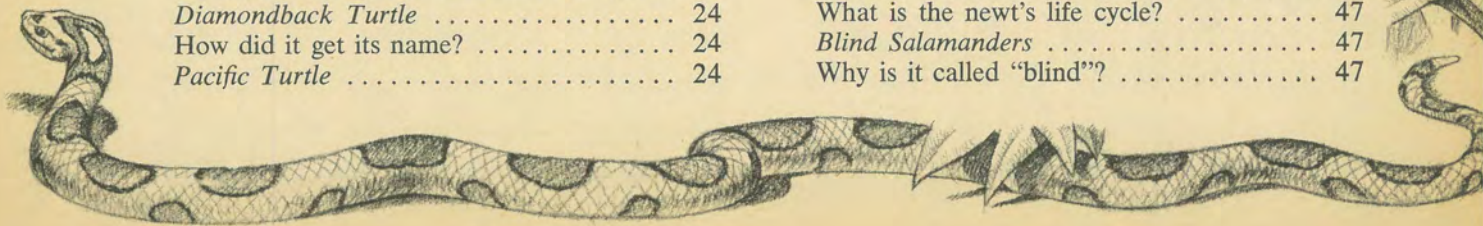
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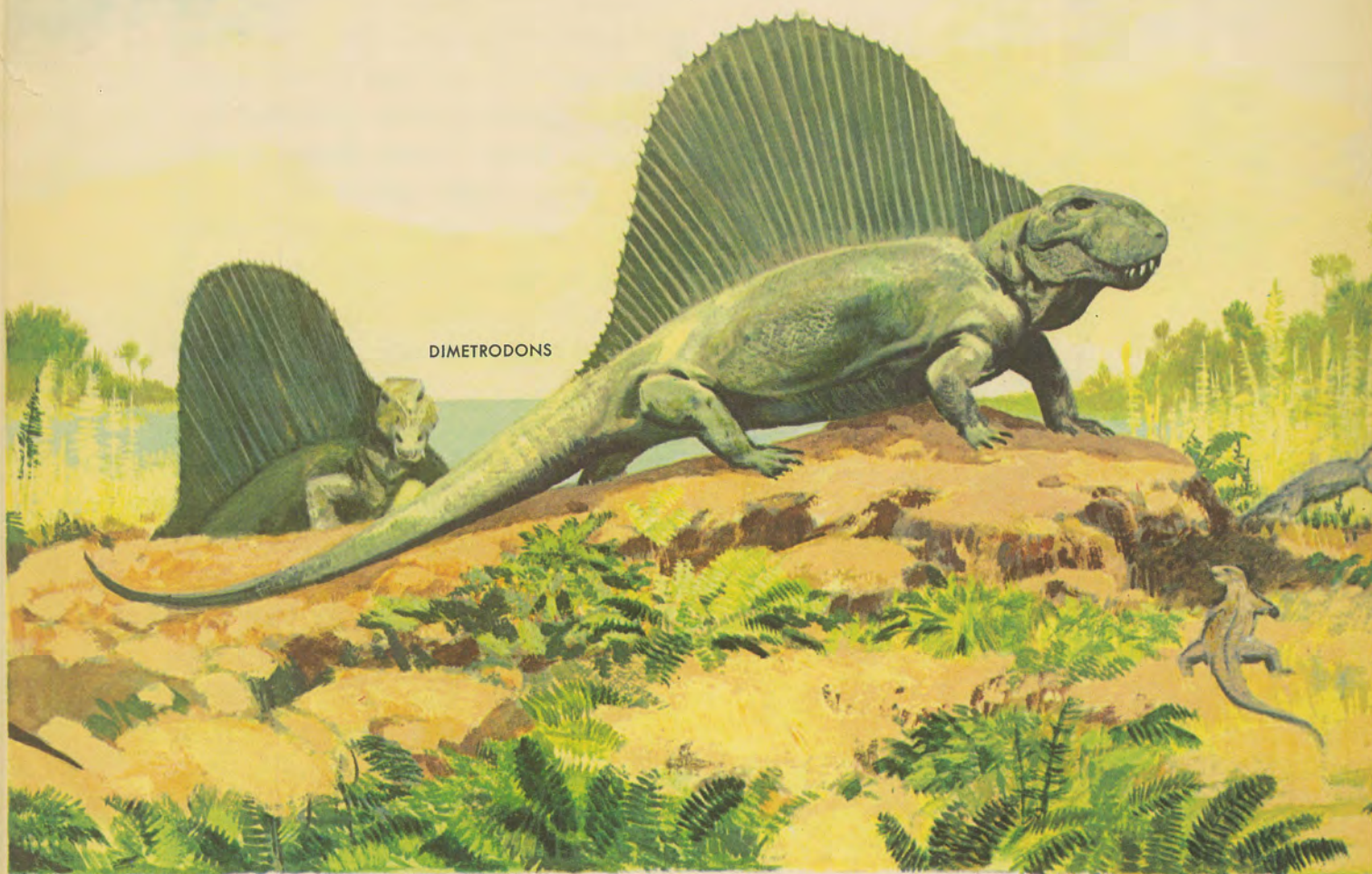


The Age of Reptiles

In the beginning, warm seas flooded over much of the land, and there was life only in the water. During certain times of the year, the pools and lakes in which these sea creatures lived dried up, and many of the animals perished. But after millions of years, some of these creatures developed the ability to breathe dry air, and they became able to spend part of their lives on the land. These creatures were called amphibians, a name which comes from the Greek word meaning "two lives."

Many amphibians eventually began to spend more of their lives on land, and in time, they became better adapted to it. Finally, some of these creatures became able to live on the land all of the time, and these land-living animals were called reptiles, which comes from a Latin word meaning "crawler."

During the early Mesozoic period in the history of the earth, about 200 million years ago, the reptiles became the most important group of animals. Other reptile forms developed, including giant



DIMETRODONS

dinosaurs which roamed the land, great sea reptiles and dragon-like creatures which flew. The dinosaurs became so large and powerful that they ruled the world for more than 100 million years.

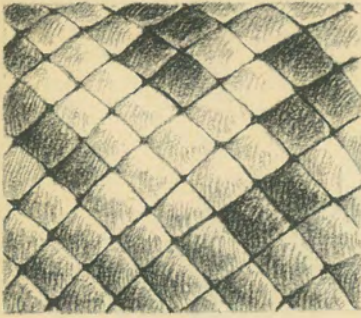
But the earth was changing. The climate, which had been warm, became cool. The swampy lands grew dry. The plant life on which dinosaurs had fed began to disappear. They were cold-blooded creatures and couldn't stand the cooler temperatures, and their huge size usually prevented them from seeking shelter in smaller caves. Plant-eating dinosaurs either couldn't find enough to eat or were unable to eat the newer

kinds of plants. And when the plant-eaters died, the meat-eating dinosaurs were left without a source of food. The giant dinosaurs were not able to change, or adapt, with the changing world and eventually, they died out.

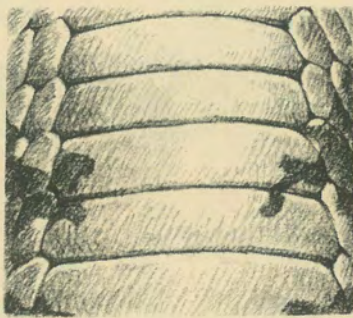
Although the giant reptiles died out, smaller forms did not and their relatives survive to this day. Why they survived is not certain. Perhaps the smaller reptiles were able to adapt to the changing conditions in the world.

Today, the living reptiles include the snakes, lizards, turtles, crocodylians (alligators, crocodiles and their relatives) and the tuatara.

Getting to Know the Reptiles



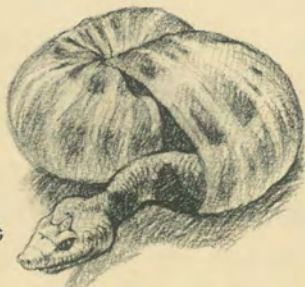
SCALY SKIN



PLATED SKIN



REPTILE TEETH



COPPERHEAD HATCHING

Reptiles are vertebrates (backboned animals) which live in warm climates. They are cold-blooded and the temperature of their bodies is about the same as the temperature about them. Their skin is either smooth or scaly, or covered with shells or plates. Reptiles have lungs and breathe air. Their teeth are usually uniform in shape and size. They lay eggs or bear living young which look just like the adult reptiles.

A group of boys, one of whom dangled a snake by its tail, ran after several girls. This was a typical boyish prank, and perhaps some of the girls were having fun at being chased. However, their fright of the snake was real.

Many people believe that it is natural to fear snakes, because all reptiles are supposed to be slimy, poisonous, repulsive creatures. Actually they are not. Only a few species are poisonous; their bodies are dry and clean, feeling somewhat like shoe leather; and, if we stop to look, we find that they are really colorful and attractive animals.

Babies and young children who have never been shown or told that they should fear reptiles rarely have a "natural" fear of them. When a small colorful snake or lizard, or even a turtle or alligator, is offered to a child who has never been taught to fear these animals, the child almost always reaches out for the reptile, wanting to cuddle and play with this interesting "toy."

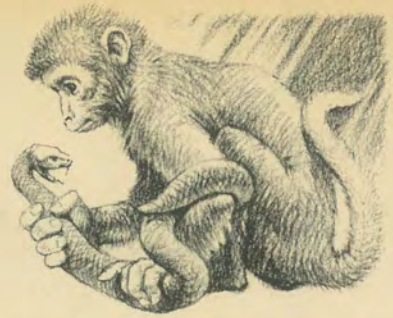
Many adults claim that they were never warned against reptiles, but that they have an instinctive terror of them. It is indeed probable that if we could see back into their early youth, we would find that something or someone gave these people the fear they now have. No one is born with a fear of snakes.

It is true, of course, that some snakes are poisonous, and it would be very foolish to touch any snake if you were not positive that it was harmless.

It is claimed, by some people, that even wild animals have an instinctive fear of snakes. Experiments have been made with the young of various animals, particularly monkeys, which, as adults, show a great fear of snakes. These experiments showed that baby monkeys that had never been near a snake showed no fear when offered one. Later the same babies were put in a cage with adult monkeys. The adults became excited when a reptile was

Do wild animals fear snakes?

wild animals have an instinctive fear of snakes. Experiments have been made with the young of various animals, particularly monkeys, which, as adults, show a great fear of snakes. These experiments showed that baby monkeys that had never been near a snake showed no fear when offered one. Later the same babies were put in a cage with adult monkeys. The adults became excited when a reptile was



Young animals fear snakes only when taught to fear.

brought near the cage, and from then on the baby monkeys showed fear. We can see that they were taught to fear snakes.

No animals have been the victims of more fanciful tales than have the reptiles. In fact, some of the stories are quite silly —

Are all stories about reptiles true?

stories such as: “There are snakes that can take their tails into their mouths and roll downhill like a hoop”; “Turtles live for a million years”; “If a snake’s head is cut off, the snake will continue to live until sundown”; “There are snakes that will wrap around your legs and whip you with their tails”; “There are snakes which can milk a cow”; “Alligators, like turtles, can live almost forever.” These statements are all false, of course.



A snake does not use its tail to whip man or beast.

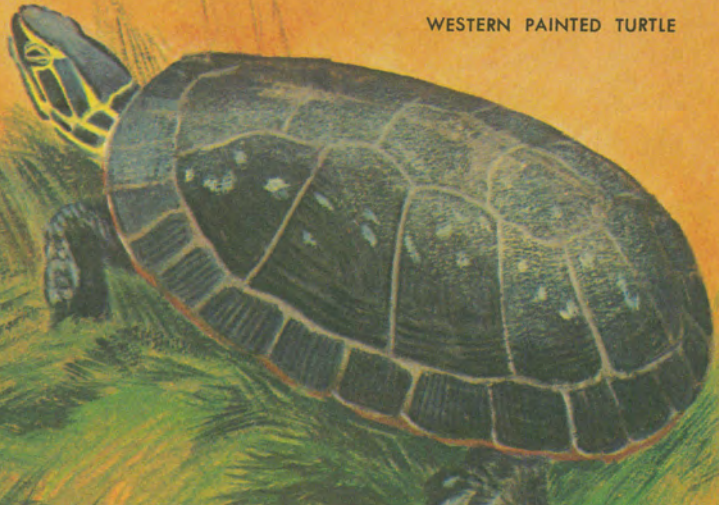


Snakes do not grasp their tails and roll downhill.

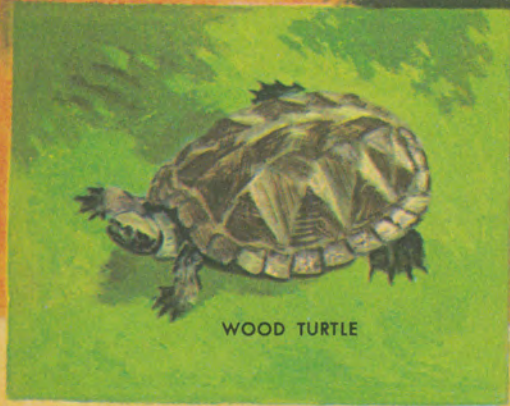


Snakes do not milk cows, goats or any other animal.

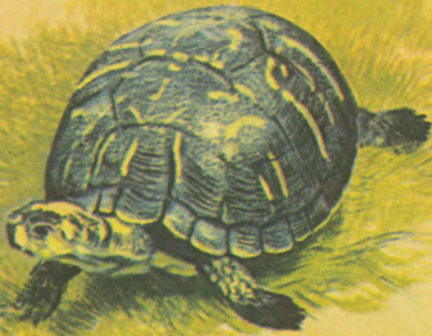
WESTERN PAINTED TURTLE



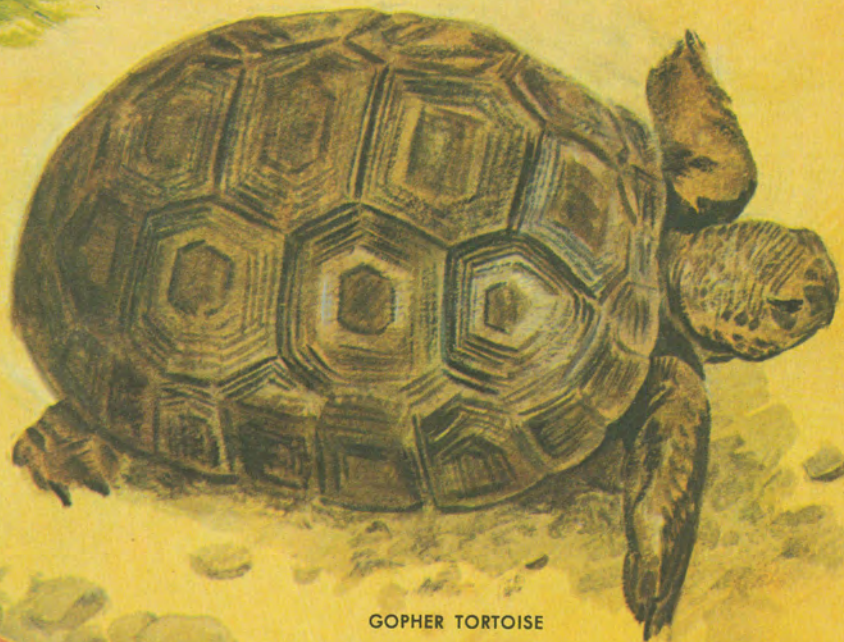
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WOOD TURTLE



BOX TURTLE



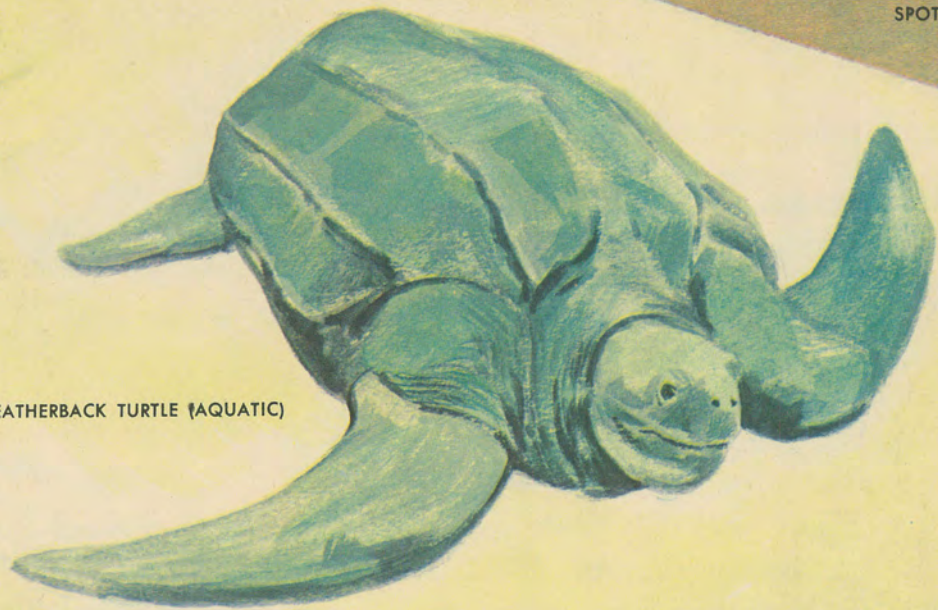
GOPHER TORTOISE



PAINTED TURTLE



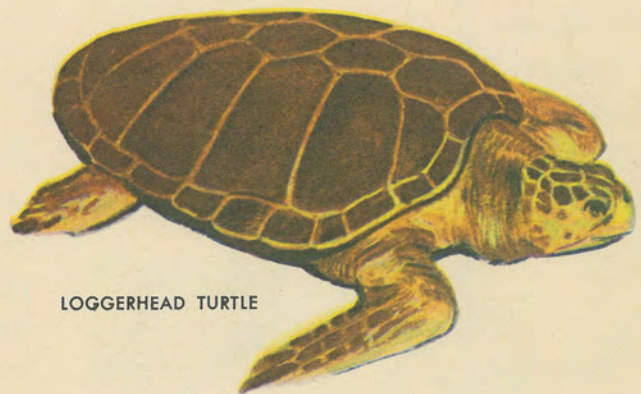
SPOTTED TURTLE



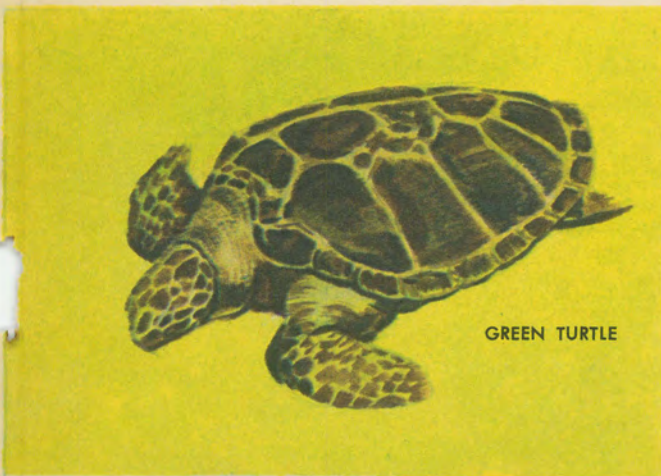
LEATHERBACK TURTLE (AQUATIC)



MUD TURTLE



LOGGERHEAD TURTLE



GREEN TURTLE



SNAPPING TURTLE

Are They Poisonous or Harmless?

The fact that some snakes are poisonous

Are all snakes poisonous? is probably one of the main reasons why people fear them.

Actually most reptiles are harmless. Of the 2,450 species of snakes in the world, only 175 kinds are dangerously poisonous.

A similar situation exists with the lizards. There are only two species which are poisonous: the Mexican beaded lizard and its first cousin, the Gila monster, or Gila, of Mexico and the United States. All the hundreds of other kinds of lizards that inhabit the world are nonpoisonous. There are no poisonous turtles or crocodilians (reptiles related to, and including, the crocodiles).

Another type of reptile which is nonpoisonous is the tuatara, a lizard-like animal which occurs only in New Zealand. Some scientists consider the tu-



The tuatara lives on coastal islands of New Zealand.

atara a living "fossil," because it is believed to have persisted in somewhat its present form for many millions of years.

It would be very convenient if all of the poisonous snakes carried a "badge," or marking or shape, by which we could easily tell them from the harmless ones. All rattlesnakes are poisonous, and can be identified by a horn-like, loosely jointed rattle at the end of the tail. However, even this can be broken off accidentally.

But there is no single way by which we can tell whether an unknown snake is poisonous or harmless, unless, of course, we are willing to look into its mouth to see if it has fangs.

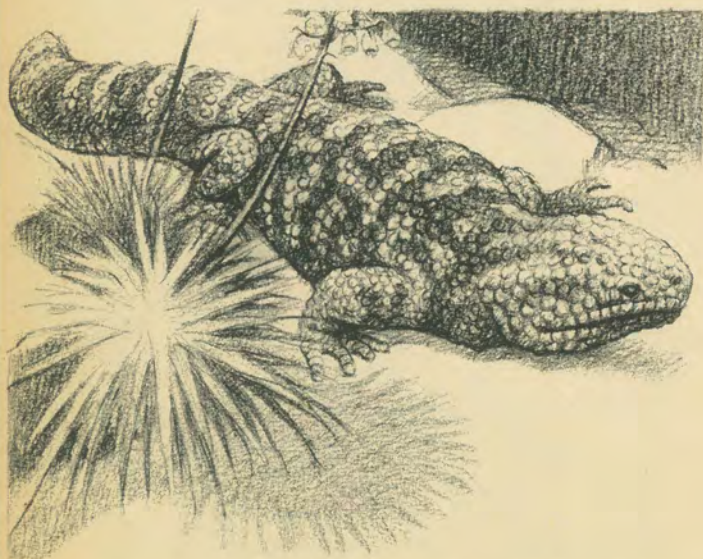
Some people say that if you smell a cucumber odor while walking in the woodland a poisonous copperhead is nearby. To prove that this method of

Can you tell a poisonous snake from a harmless one?

poisonous snakes carried a "badge," or marking or shape, by which we could easily tell them from the harmless ones.

Can you locate poisonous snakes by their odor?

a cucumber odor while walking in the woodland a poisonous copperhead is nearby.



The Gila gets its name from the Gila River, Arizona.

identifying snakes is risky, just ask your friends what a cucumber smells like. You will undoubtedly be given many different answers, which proves, of course, that you cannot locate copperheads or, for that matter, any snake, by their odor.

Another misleading belief about snakes

Can you tell a poisonous snake by the shape of its head?

is that if one has a triangular or diamond-shaped head it is poisonous.

Some of the world's most dangerous snakes, including the king cobra of Malay, the black mamba of Africa and the coral snake of the United States, have blunt rounded heads. On the other hand, many of the water snakes in the United States and other countries have distinct triangle-shaped heads and are harmless. You cannot identify a poisonous snake simply by the shape of its head.

Another belief is that snakes with eyes

Can you tell a poisonous snake by the shape of its eyes?

that have round pupils are harmless, and those with elliptical pupils — like those of a cat — are

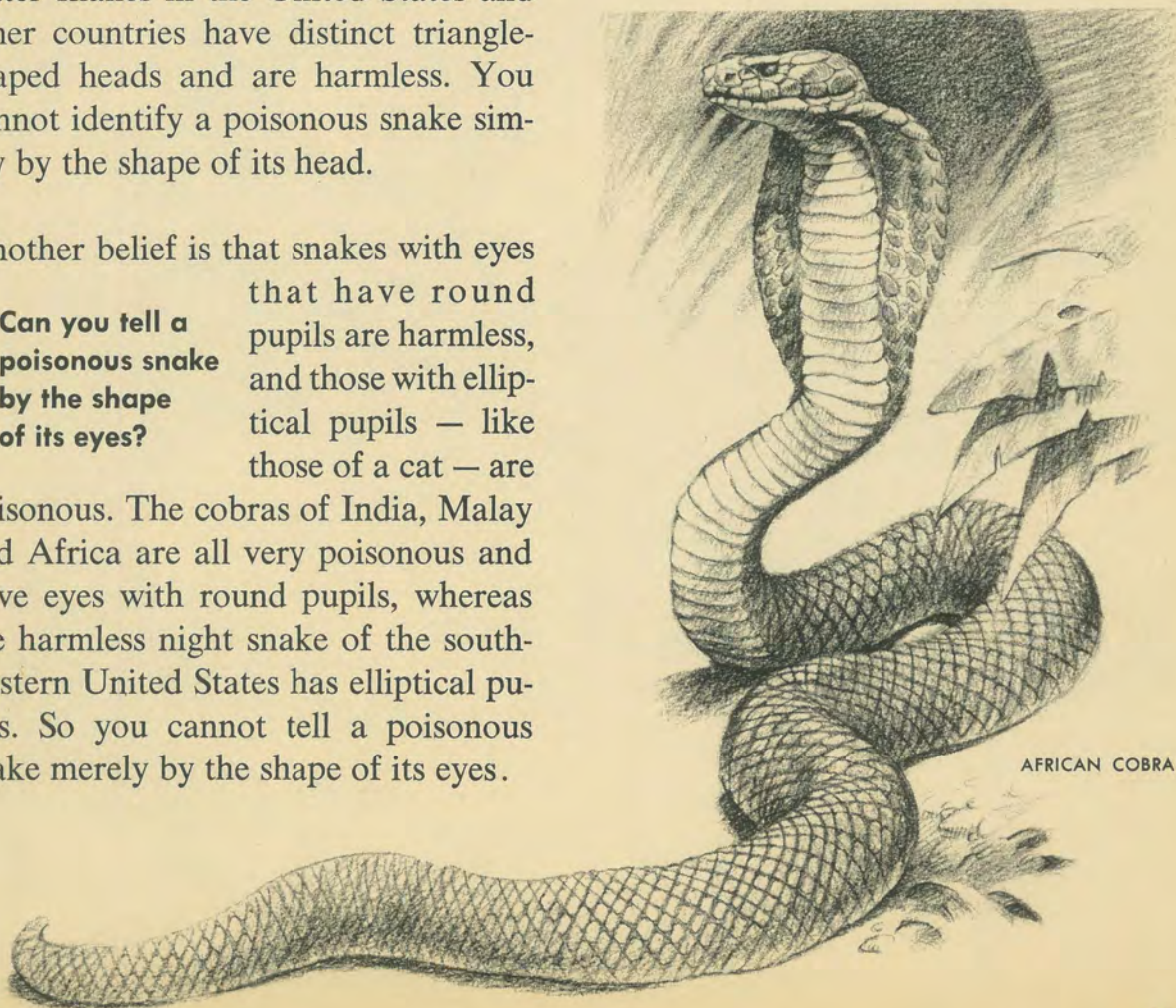
poisonous. The cobras of India, Malay and Africa are all very poisonous and have eyes with round pupils, whereas the harmless night snake of the southwestern United States has elliptical pupils. So you cannot tell a poisonous snake merely by the shape of its eyes.



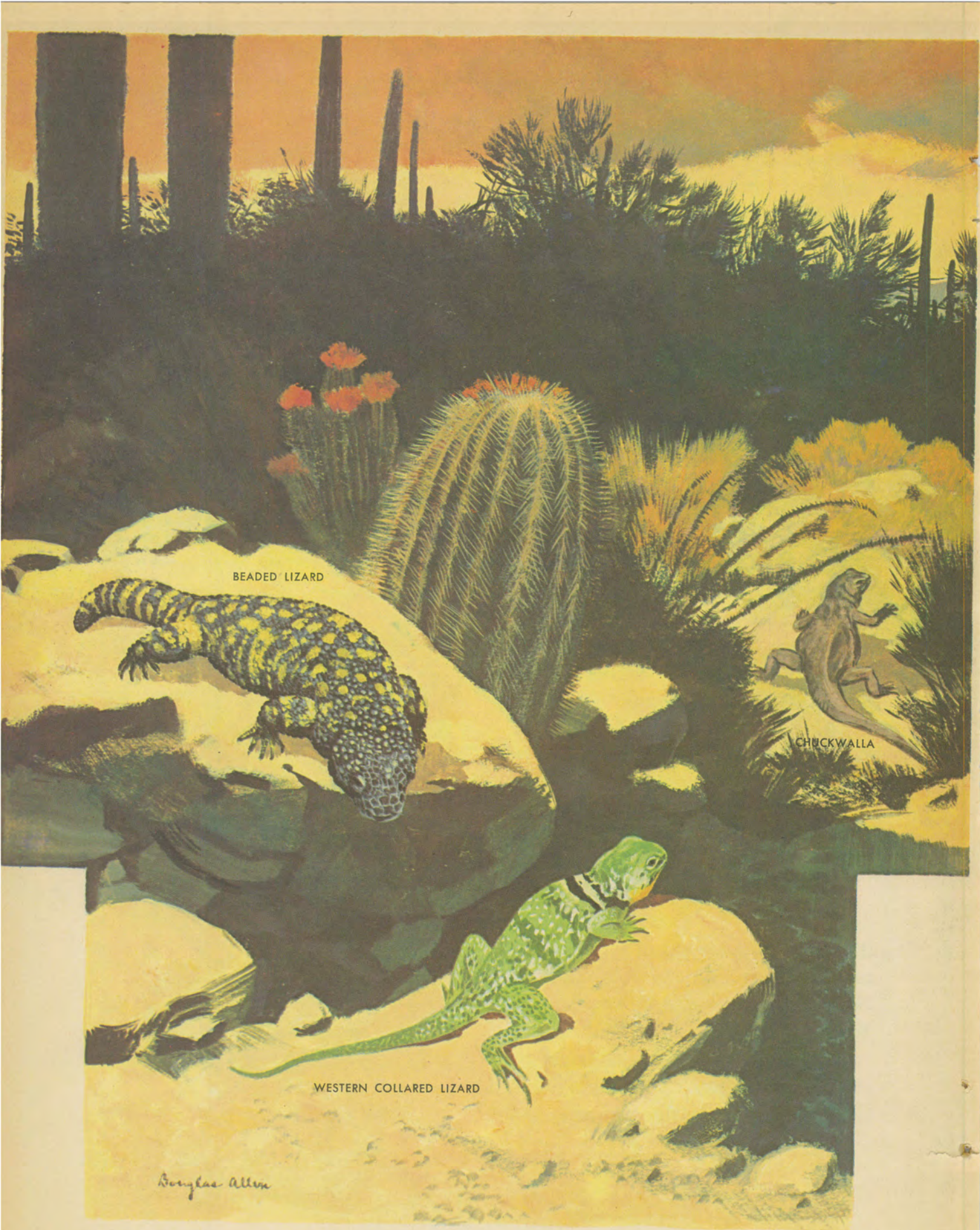
This is the safe and correct way of holding a snake.



Snake skulls: poisonous (left); nonpoisonous (right).



AFRICAN COBRA

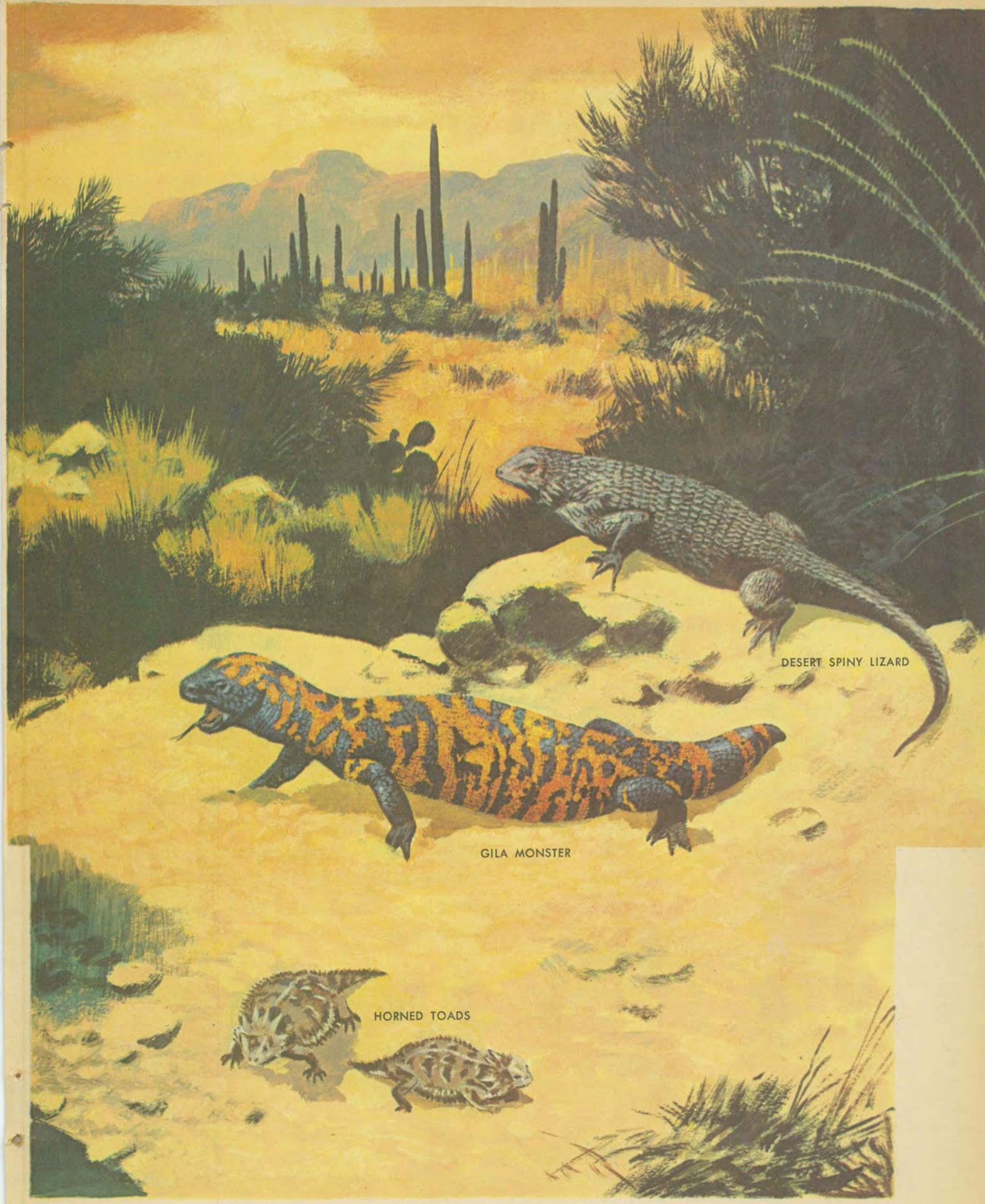


BEADED LIZARD

CHUCKWALLA

WESTERN COLLARED LIZARD

Douglas Allen



DESERT SPINY LIZARD

GILA MONSTER

HORNED TOADS

One of the most popular errors about snakes is that all green-colored snakes are venomous. The green mamba of Africa is one of the most deadly snakes known, but the green snake from the northeastern United States is completely harmless; in fact, it will not even offer to bite. So all snakes that are green in color are not necessarily poisonous.

Are green-colored snakes poisonous?

The forked tongue which many a reptile possesses is never poisonous; it merely serves as a taste organ, but not in the same way as ours. The reptile's tongue darts from its mouth and waves up and down, and the "taste" that is on the air is picked up. When the tongue is redrawn, the taste is wiped off as it rubs across an organ in the roof of the mouth. In this way the reptile is able to tell what is near. This is a very sensitive organ and snakes are believed to be able to detect water at great distances by this method.

Is the tongue of reptiles poisonous?

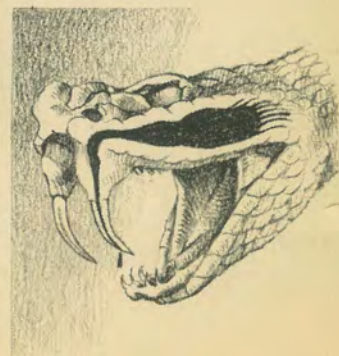
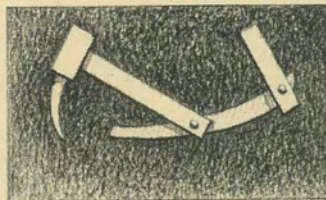
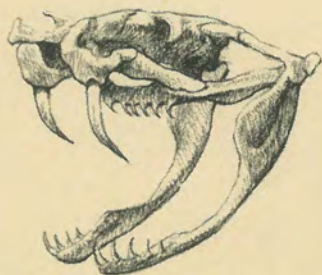
The poison apparatus of the reptile consists of a set of hollow teeth (fangs), which are connected to ducts (fleshy tubes). The ducts, in turn, are connected to poison glands at the sides of the head. The snake has to strike or bite with these hollow teeth in order to inject the poison.

Where does a snake carry its poison?

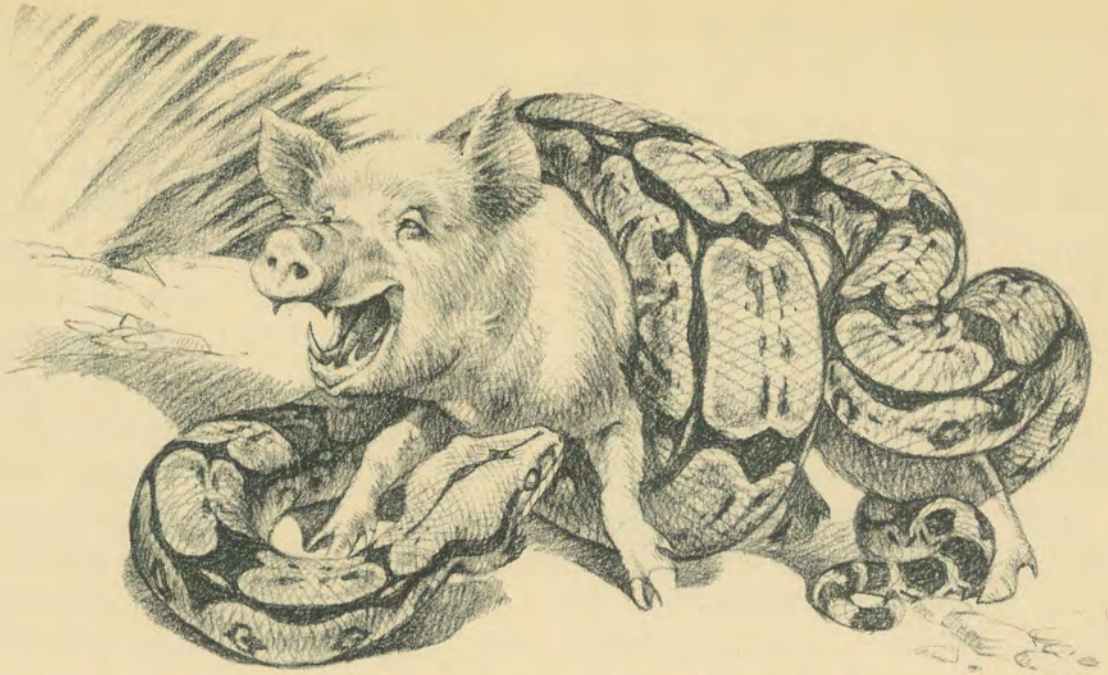
Not all snakes have the same kind of poison. Some have a somewhat similar poison, called a haemotoxin, a kind that affects the blood. These include the rattlesnakes, copperheads and moccasins of the United States and Mexico, as well as many of the vipers, such as Wagler's and temple vipers of Malay and Russell's and Gaboon vipers of Africa.

Do all snakes have the same kind of poison?

Cobras of Africa, Malay and India, tiger snakes of Australia, and coral snakes of the southeastern United States, as well as many others, have neurotoxins, a poison which affects the nerves. Some amount of each type of poison is present in the venom of each kind of snake, so if we are to be treated for snakebite we shall have to use the serum for the particular snake that did the biting.



Two tubes lead from the snake's poison glands or sacs to its fangs, which are hollow. When the snake bites its victim, poison from the glands is squeezed through the fangs. The illustrations (right to left) show a rattlesnake head, skull, mechanical action of the jaws, and poison sac location (dark area). Only when injected is venom poisonous.



The twelve-foot-long boa constrictors of tropical America prey on birds and mammals.

A unique poisonous snake is the African

**Can snakes spit
their poison?**

spitting cobra. This reptile, about three to four feet in length, lives in the jungle. It not only injects its poison by biting, but when its prey or an enemy approaches, it raises its forward end off the ground and by quickly flicking the head forward, ejects small droplets of venom from the tips of its hollow fangs. At the same instant it exhales with a sharp hiss. The poison thus sprayed gets into the eyes of the victim and causes considerable harm, particularly if the eyes are rubbed.

The poisonous Gila monster and the

**How do lizards
inject poison?**

Mexican bearded lizard do not have hollow teeth. Their venom glands are situated in the lower jaws. They cannot poison their prey unless they chew and get the venom into the victim.

What Do They Eat?

The nonpoisonous snakes use other methods to catch their prey. Many are constrictors that grasp the food with their teeth and then

throw loops of their bodies, in coils, around the victim. Usually, they kill not by crushing the animal, but by preventing it from breathing. Both big snakes and little snakes use this constricting method to kill their prey.

Some of the big snakes which do this are the regal python of Malay, which reaches a length of thirty feet; the twelve-foot boas and twenty-five-foot anacondas of South America; and the fifteen-foot pythons from India. Smaller ones are the mountain black-snake from the northeastern United States and the California king snake, as well as hundreds of others.

The nonconstrictors catch their food by either grasping with the mouth and pressing the prey beneath their body or by merely swallowing it whole. All snakes swallow their food whole, because they do not have chewing or grinding teeth. Their teeth are shaped like curved needles, which hook into the prey, holding and manipulating it into the snake's throat. Their jaws are loosely connected at the skull and chin and this peculiar arrangement enables them to open their mouths very wide. Further, their overlapping body scales can be spread apart, so that bulky food can be swallowed.

How do the nonconstrictors catch food?

A twenty-five-foot regal python can easily devour a half-grown pig. A meal of this size usually takes more than an hour to swallow. Then the snake finds a suitable hiding place and may stay there more than two weeks before the meal is completely digested. The snake extends its windpipe out of the side of its mouth, like a snorkle, enabling it to breathe while eating the pig.

Do they eat large animals?

Lizards, turtles and crocodilians also have interesting feeding habits. The African chameleon lizard captures food with its tongue. These six-to-eight-inch lizards slowly move through the bushes and trees, clasping small limbs with their clawlike feet, while their eyes are constantly searching for insects. The eyes protrude

How do lizards catch food?

at each side of the head and each eye can look in a different direction at the same time.

When an insect is discovered, the lizard slowly approaches until it is about its own body length away. Suddenly, with tremendous speed, the tongue shoots out and the insect disappears down the lizard's throat. The tongue is almost as long as the lizard and is tipped with a sticky, fleshy end which adheres to the prey. Almost before the insect can move, it finds itself drawn into the lizard's mouth. African chameleons have the ability to change color and usually match their surroundings so well that they are hard to find.

The American chameleon of the southeastern United States and islands of the Caribbean, while not true chameleons, can also change their body colors. These are the small lizards which are sold at the circus or pet shop. They can run very fast, and they capture insects by pouncing upon them.

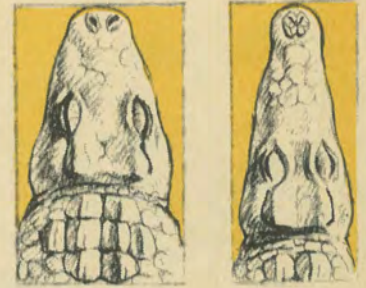
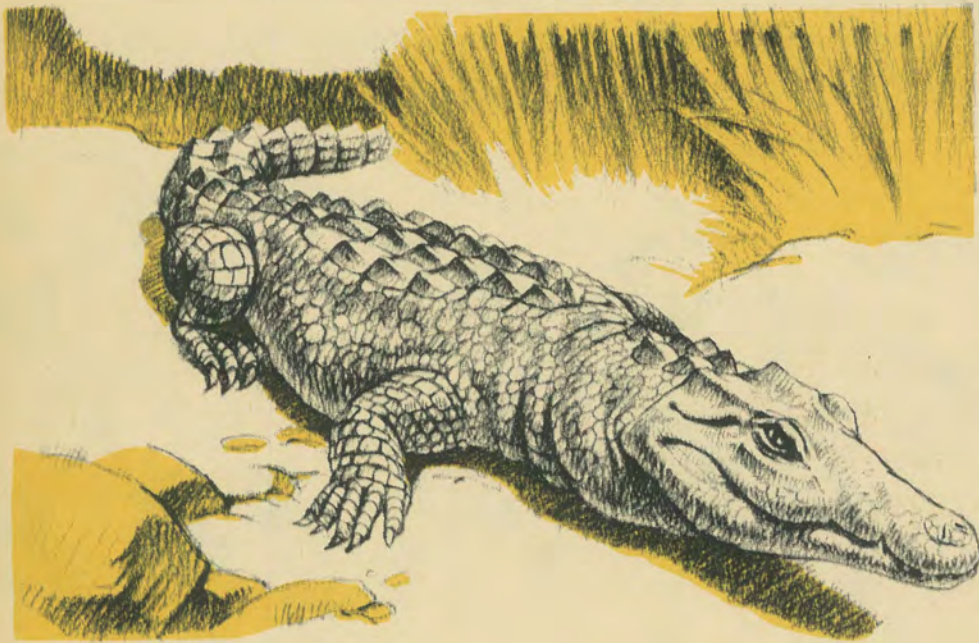
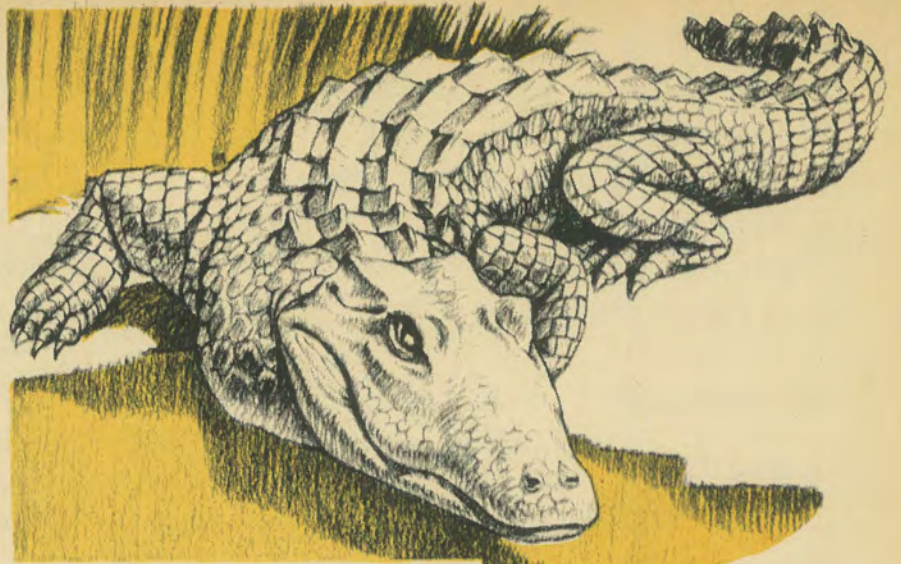
How Do They Move?

Turtles move slowly as they walk, but there are times when they can move very fast. The surprisingly quick lunges of the eighteen-inch common snapping turtle of the eastern United States and the large alligator snapping turtle of the Mississippi River can be dangerous, especially if we get too close to their strong jaws.

Can turtles move fast?

The mata mata turtle of Guiana and northern Brazil, when feeding, moves so

American alligator (right);
American crocodile (below).
When a crocodile closes its
mouth, two teeth on either
side of the lower jaw stick out.



Heads of alligator (left) and
crocodile (right). The alligator's
snout is broad and rounded
while the crocodile's is pointed
and its head is narrower.

fast that we can hardly follow the motion. This turtle is well camouflaged by its irregular shape and the fleshy folds of skin around the head, as well as by the water plants (algae), which are usually found growing on the shell. On discovering a small fish, the mata mata moves toward its prey ever so slowly — like a slow-motion movie. When it is about eight to ten inches from the swimming fish, it stops, and with a motion too quick to follow, its head shoots out and the open mouth sucks in the unwary food. The neck, so long that it lies folded

beneath the shell, is seen to extend during this action.

Equally surprising are the movements of crocodiles and alligators. Baby crocodiles and alligators make short grunting sounds that, at times, must sound to their mothers like warning cries. When they make these sounds, the parents often race to their aid with surprising speed. Large crocodilians live in many of the tropical and sub-tropical countries

**Can crocodiles
and alligators
move fast?**

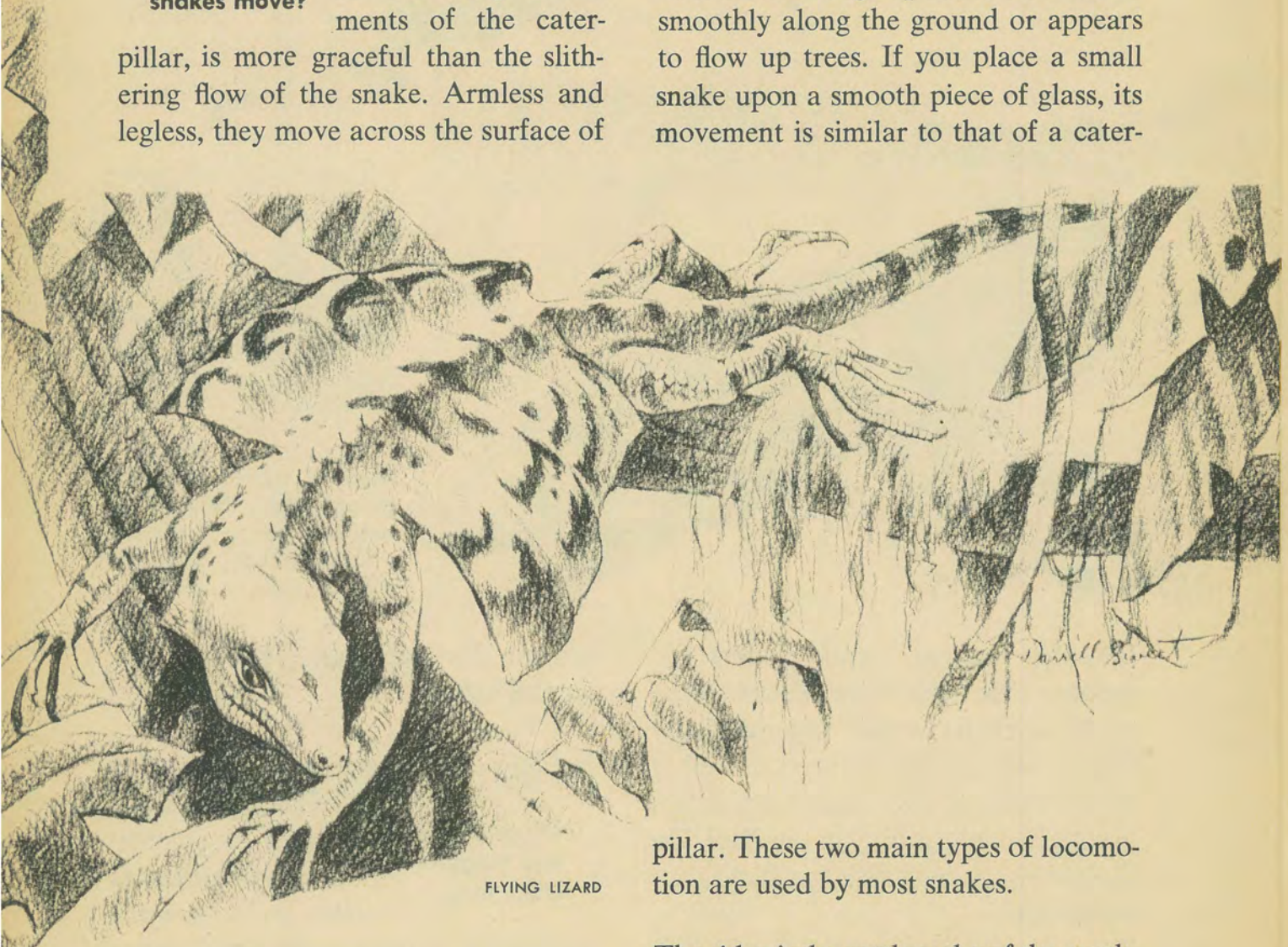
of the world including Africa, Mexico, Central and South America, and the southern United States. Alligator hunters say that some of these reptiles can move, for short distances, faster than a man can run.

No movement of any animal, even the lithe gait of the tiger or the wavy movements of the caterpillar, is more graceful than the slithering flow of the snake. Armless and legless, they move across the surface of

How do snakes move?

forward part of the body is stretched out until it touches another rough spot, such as a rock. If this spot is held with a crook of the body, the tail can then be drawn up and placed at this spot, too, and in this way, the snake's body can be pushed or pulled forward.

There are many rough spots that a snake can use and if it inches its body over all the rough spots, it then moves smoothly along the ground or appears to flow up trees. If you place a small snake upon a smooth piece of glass, its movement is similar to that of a cater-



FLYING LIZARD

the ground or climb trees with great ease. If we watch carefully we can soon understand how they move.

First the tail is held against a rough spot, such as a clump of grass. Then the

pillar. These two main types of locomotion are used by most snakes.

The sidewinder rattlesnake of the southwestern United States and the desert viper of Africa live on the soft shifting sands of the desert and, for this reason, crawl with another kind of

How do desert snakes move?

motion. By throwing loops of its body forward, the desert snake can lift the remaining part of its body off the sand, bringing it up to the forward loop. This causes it to move with a sidwinding motion, and is the reason for the name "sidewinder."

The most unusual kind of travel practiced by snakes is used by the flying snakes of Malay. These colorful reptiles, fifteen to eighteen inches in length, are arboreal (tree-dwellers),

Can any snakes fly?

by the flying snakes of Malay. These colorful

escape by running across the surface of the water. The toes of these lizards are provided with flaps, which are erected as the lizards run. This causes the foot to become a flat pad, which provides a surface sufficient to support their weight on top of the water. When they are far enough away from danger, they stop running and sink out of sight.

Some small desert lizards, such as the sand skink, escape their enemies by diving into loose sand. Then, by a swimming motion, they progress quite rapidly beneath the surface. The geckos, a



Flying lizards glide from tree to tree with the aid of their folds of skin. The harmless, ridge-toed gecko gets its name from the cry it makes.

and when they choose to go from place to place, particularly in times of danger, they flatten out the body and slide off into space. The great width of the flattened body enables them to glide to the ground or to another limb, and in this way they escape.

The basiliscus lizards, eight to twelve inches long, live along the edges of swamps and rivers in Central America. When chased by an enemy, they

How do lizards move?

group of small lizards living in the warm countries the world over, have ridges across their toes which act somewhat like suction devices. This enables them to run across a smooth surface, and they are often seen running along the ceilings of houses in pursuit of insects.

The sea turtles are very ancient types of reptiles that have existed in somewhat their present form for more than 150 million years. Graceful swimming movements with flipper-like legs give them the appearance of flying through the water.

Are Reptiles Valuable?

These large marine reptiles stay in the ocean throughout most of their lives, coming ashore only to lay their eggs. In the evening, in early summer, many of the females come from the waters of the tropical Atlantic and Pacific to visit the sandy beaches along the coasts of the United States, Mexico, Central and South America. They make their way to a place above the high-tide mark, where they scoop out a shallow basin in the sand. In a period of two to three hours a turtle will lay from 100 to 150 eggs in this "nest." She then spends some time covering the clutch (a nest of eggs) by pushing and patting sand into it. No further care is given the eggs and they are left to the warm moist sand until they hatch. Turtles do not sit on their eggs as birds do.

Where do sea turtles lay their eggs?

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Fishermen along these beaches will seek out such nests, for the eggs are good to eat. The adult turtles are also sought as food. A prize catch is the large Atlantic green sea turtle, which weighs between 150 and 200 pounds. Its meat is tasty and it is also used for making turtle soup.

Can we eat the eggs of sea turtles?

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Before the advent of plastics, the shells of hawksbill sea turtles, which measure from twenty to thirty inches, were extensively used for making fancy buttons and rims for eyeglasses.

In what ways are reptiles valuable to us?

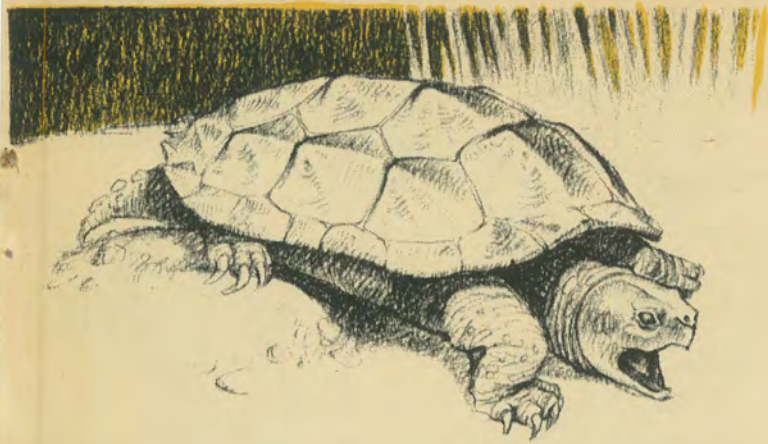
of hawksbill sea turtles, which measure from twenty to thirty inches, were extensively used for making fancy buttons and rims for eyeglasses.



The turtles (above) are laying eggs and covering them with sand for both warmth and protection. At the right is a snapping turtle hatching from its egg.

In many shops we find leather goods made from the hides of alligators, snakes and lizards, including such items as purses, wallets, handbags, shoes, belts and many other articles. Not too long ago the Florida State Conservation Department had to pass a law forbidding people to take alligators from that state, lest they become extinct. Most of the leather now used to make these articles is imported from South America.

At Silver Springs, Florida and at San Butanton, Brazil, there are large snake farms where venom is extracted from poisonous snakes. This venom is processed and used as a medicine, which is very effective in treating certain kinds

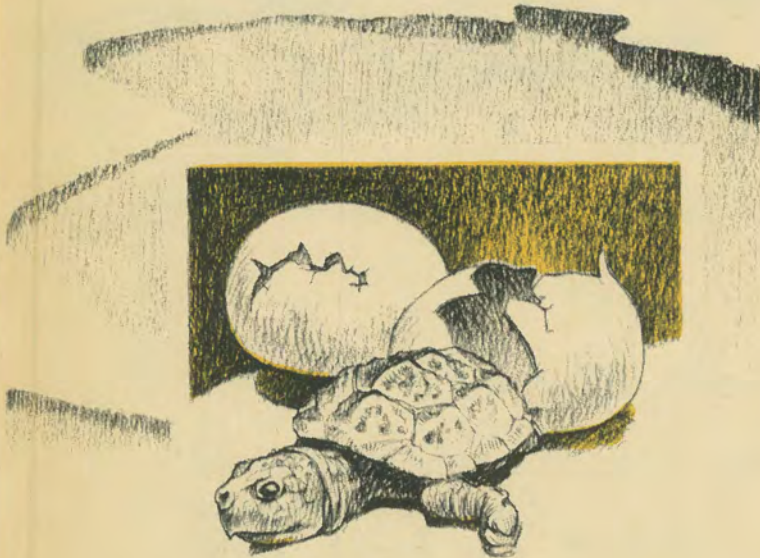


part of their diet is made up of insects and rodents. It has been estimated that rodents destroy foodstuffs worth over 200 million dollars each year, so anything that preys on rats, mice, gophers and similar vermin is a good and valuable friend of man.

Reptiles of many kinds are found in the temperate and tropical countries of the world. They are of many different shapes, sizes and colors. One example is the thirty-foot giant gavial of Africa, a crocodile-like animal which lives along the Nile River and has an extremely long snout. Another is the wormlike blind snake, eight to twelve inches long, that lives beneath the ground in the southwestern United States and in Mexico. There are many forms that are only rarely seen, and others are commonly found near our homes.

How can we get to know more about reptiles?

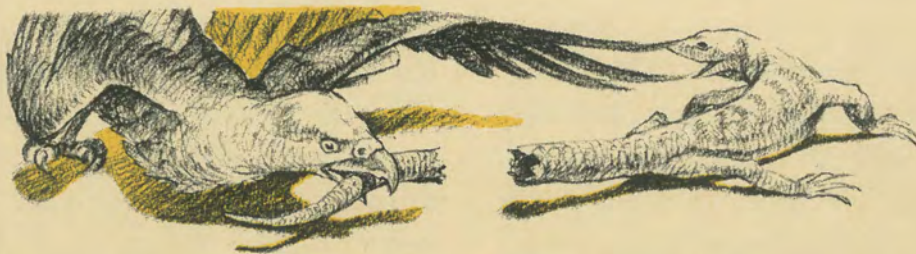
A great deal of fun and education can be had by reading about the many kinds and by visiting zoos and museums where living specimens can be studied. However, the most interesting way to learn more about these animals is to go afield and collect them. The following lizards, turtles and snakes are not only interesting, but they are easily collected.



of human sickness. Snake venom is also used to make the serum for the treatment of snake bite.

A small industry has been started in Florida for the canning of rattlesnake meat for food.

Perhaps the greatest service reptiles render to man arises from the fact that reptiles like to eat, and that the larger



The lizard's tail, torn off by a bird, will regenerate (grow back to original form).

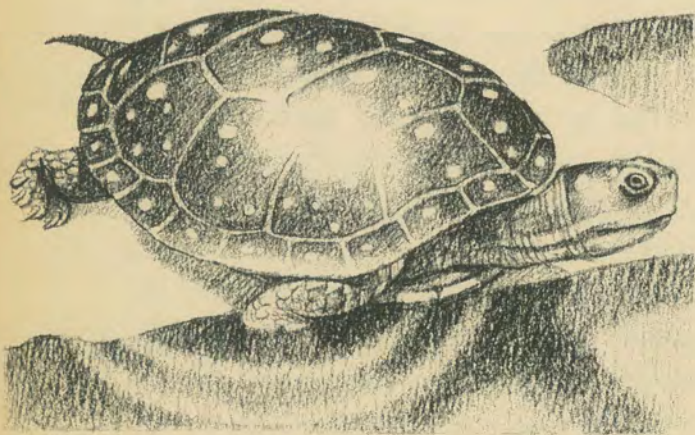
Turtles

Spotted Turtle

The round orange-yellow spots on the black carapace (top shell) give the spotted turtle its name. These turtles, three to five inches long, are found throughout the eastern United States, where they live in the quiet waters of small ponds, lakes or swamps. Occasionally, they migrate from one pond to another and at these times they seek out the damp places on the woodland floor. Like many of the aquatic turtles, spotted turtles feed only when they are in the water. They use water to wet the food, thereby making a meal easier to swallow. Their food consists of worms, insects, fish and some aquatic plants.

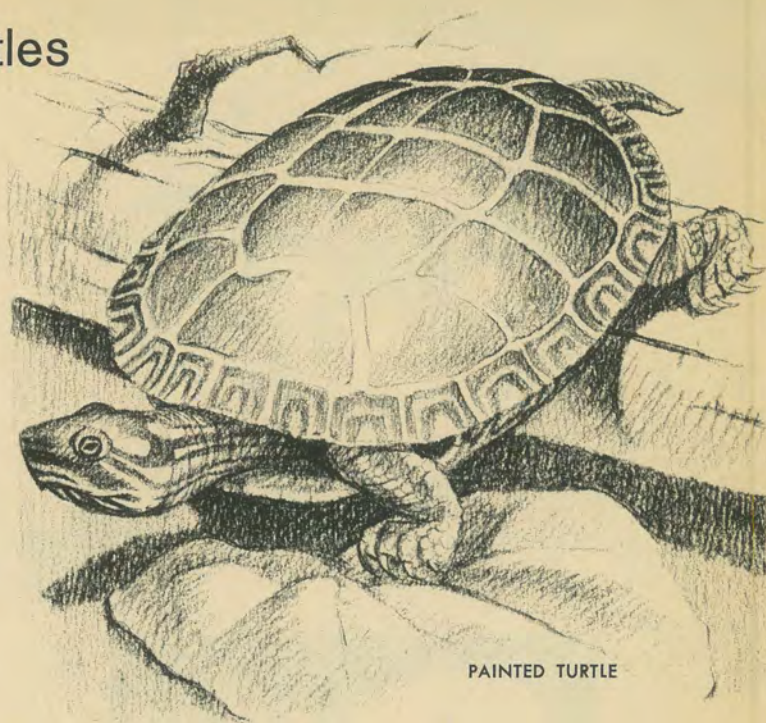
How did the spotted turtle get its name?

black carapace (top shell) give the spotted turtle its name. These turtles, three to five



The common spotted turtle makes a good house pet.

Specimens are found occasionally without spots and these can be identified by the smooth shell and the orange-yellow bands on the head. They make excellent pets, which soon become tame and feed from the hand.



PAINTED TURTLE

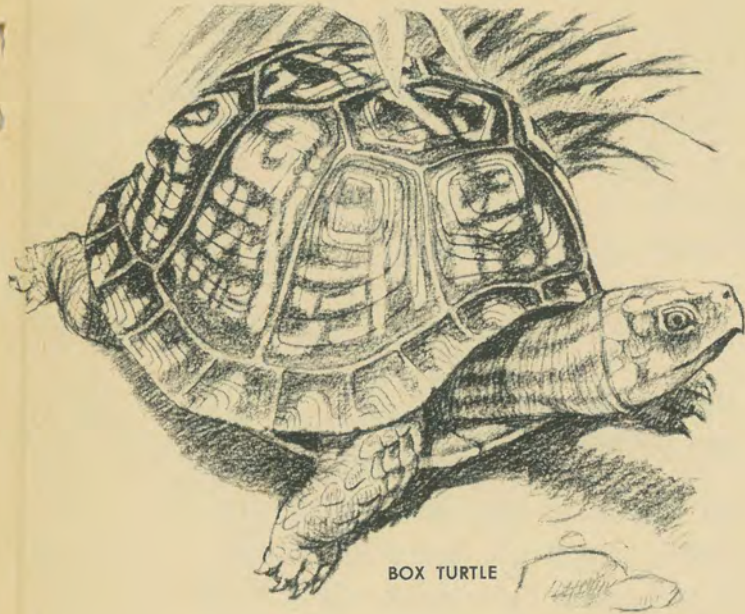
Painted Turtle

This is one of the more common pond turtles that are often seen sunning themselves on a rock or floating log in the middle of a pond. When disturbed, they quickly slide into the water and bury themselves in the soft bottom mud or debris. They are easily identified by the mottled yellow to orange-red border of both the carapace and plastron (bottom shell). These markings and the stripes of yellow, red and black on the head are reasons for the name "painted turtle."

How did the painted turtle get its name?

turtles that are often seen sunning themselves on a rock or floating log in the middle of

They are found throughout the United States, except in the extreme west. They rarely leave the water where they catch their food—insects, salamanders, worms and fish. Young specimens are very attractive and are often sold by animal dealers and in pet shops.



Box Turtles

Because of a broad hinge across the forward third of the plastron, box turtles can draw up their lower shell inside of the carapace. In this way they can completely "box" in all of the soft parts of their bodies as a protection against enemies.

How does a box turtle protect itself?

These turtles are favored as pets. They have a friendly disposition and can be freely handled. They are often seen roaming through woodlands and fields, particularly after a heavy rain, seeking insects, worms, berries and green vegetation. They are not aquatic, but they do not hesitate to enter the water and sometimes are found bathing.

There are four kinds in the United States, found from Texas to the Atlantic coast. All have yellow to yellow-orange stripes or markings on a carapace of

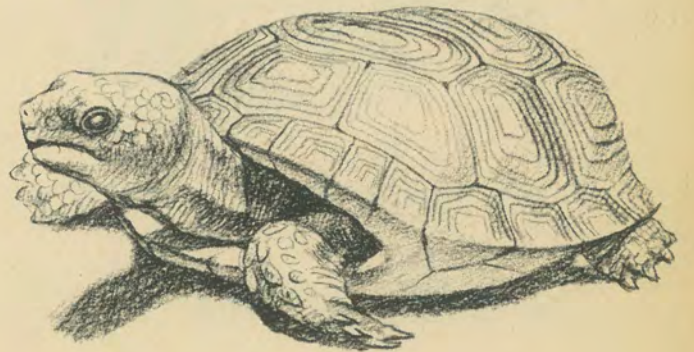
deep rich brown. A specimen which had been in captivity for some five years became so tame, that whenever it was hungry, it would patiently wait near a feeding dish for its dinner.

Gopher Tortoise

The names tortoise, terrapin and turtle are really interchangeable. However, the word "tortoise" is generally used to name the kind that live in arid places, such as the Galapagos Islands off the coast of Ecuador. These islands are the home of the giant Galapagos tortoises that grow three feet in length. The names turtle and terrapin are usually used to describe those that live in or near the water.

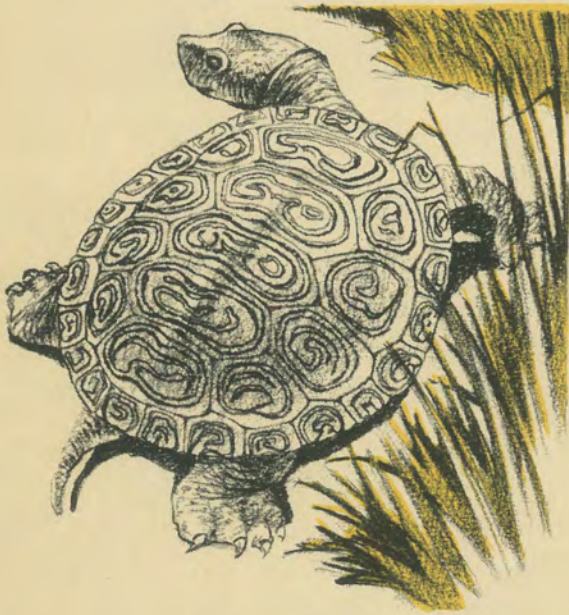
Should we say "tortoise" or "terrapin" or "turtle"?

The gopher tortoises found in the United States live in sandy regions in many of the southern states between South Carolina and Texas. Unlike the other turtles, whose feet are flat and



The burrows of the gopher tortoise give it its name.

webbed and adapted for swimming, the tortoises have stumpy feet which are better suited for travel over the dry ground. The gopher tortoises make their homes in tunnels which they dig in the loose earth. At the far end of the tunnel, they excavate a small "room" in which they can turn about. In the wild they feed upon berries, grasses and insects. Specimens taken as pets can be fed berries, lettuce, apples and other fruit. In captivity, these reptiles like a pan of water in which they soak for long periods of time. Perhaps in the wild they get a great deal of moisture in their burrows.



The diamondback eats plants, worms and shellfish.

Diamondback Turtle

These turtles can be found along the Atlantic coast from Maine to Florida, and in the Gulf of Mexico from Florida to Texas. They live in salt and brackish water marshes and bays. At one time they were heavily hunted for food, but

now their numbers are increasing. Small specimens are particularly attractive. However, collectors will find it difficult to keep them alive unless the turtles are provided with a tank of marine water with ample circulation. Adults can either be caught in the marshes or purchased at local fish markets.

The plastron is yellowish in color and the large scales on the carapace have a series of whitish grooves, outlined against a gray-black color. The grooves, which are more or less diamond-shape in outline, are the reason for the name "diamondback." Many turtle farms where these specimens are raised are situated along the coast between Maryland and Florida.

**How did it
get its name?**

the large scales on the carapace have a series of whitish grooves, out-

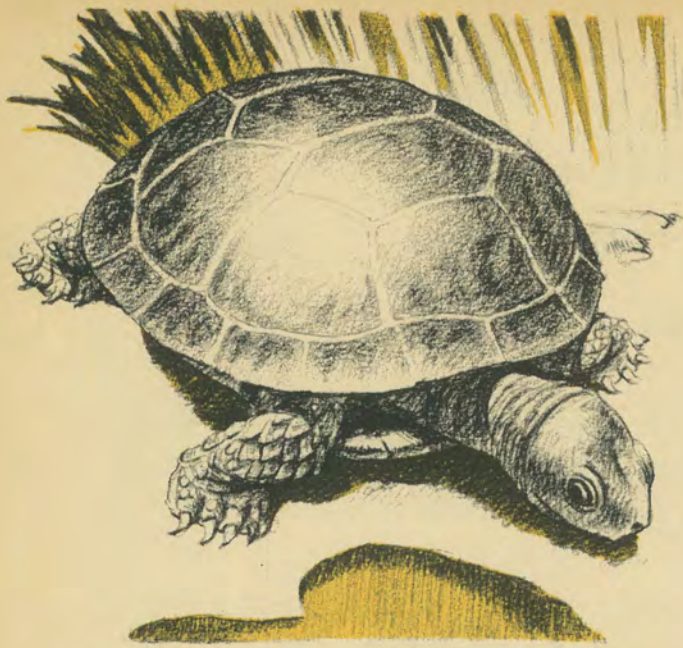
lined against a gray-black color. The grooves, which are more or less diamond-shape in outline, are the reason for the name "diamondback." Many turtle farms where these specimens are raised are situated along the coast between Maryland and Florida.

Pacific Turtle

The good nature of the Pacific turtle makes it an excellent pet. It is very responsive when taken into captivity, and soon loses its fright. It will take food from the hand and, if regularly fed at a certain time, it will always be found waiting. It is a relative of the eastern spotted turtle, but is found only in the lakes, ponds and quiet streams along the Pacific Coast between Washington and California. Faint traces of yellow are found on the carapace, which has a ground color of soft olive-brown, and there is a mottling of yellow along

**Can you
feed it
by hand?**

It is very responsive when taken into captivity, and soon loses its fright. It will



The Pacific turtle is about six to seven inches long.

the sides of the plastron. This reptile feeds upon crayfish, insects, some plants and fresh fish. A tank with a good supply of fresh water is needed to keep Pacific turtles happy.

Softshell Turtles

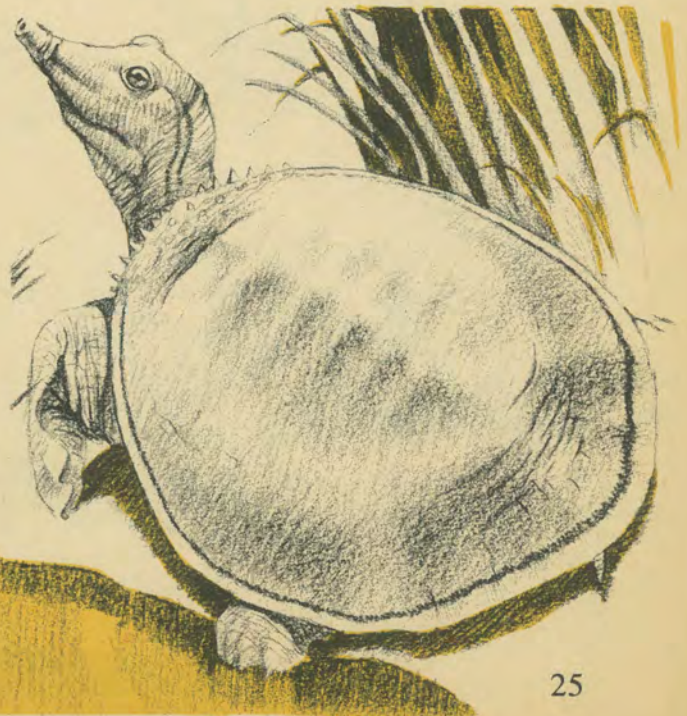
The sharp jaws and bad tempers of the adult softshell turtles, which are fifteen inches long, suggest that we avoid them. However, baby specimens are extremely interesting and are easy to keep. They feed upon crustaceans, fish, worms and insects. In captivity, they will readily take fish and pieces of meat. A well-fed specimen grows rapidly and, once tamed, usually remains friendly.

Softshell turtle



In the wild, it often lies in the shallow water, partially buried in the soft mud. It occasionally extends its long neck and head toward the surface, and the tip of its long nose breaks through the water for air. This is a handy protection, because these aquatic reptiles with their soft shells, if discovered, would become easy prey to the animals that hunt them. When on land they can move with surprising speed, but they rarely stray far from water. If threatened, they will quickly dive down to the bottom where they hide in the mud.

A number of species in the United States are found in many waterways through the south and southwest and throughout the whole central region as far north as the Great Lakes. Occasionally, African softshell turtles are sold in pet shops in large cities. Large African specimens are as dangerous as the North American varieties, and should be handled carefully.





Lizards

It is easy to recognize the resemblance between the present-day lizards and the giant dinosaurs. Many millions of years ago, during the period when

Why did the ancestors of the lizards survive?

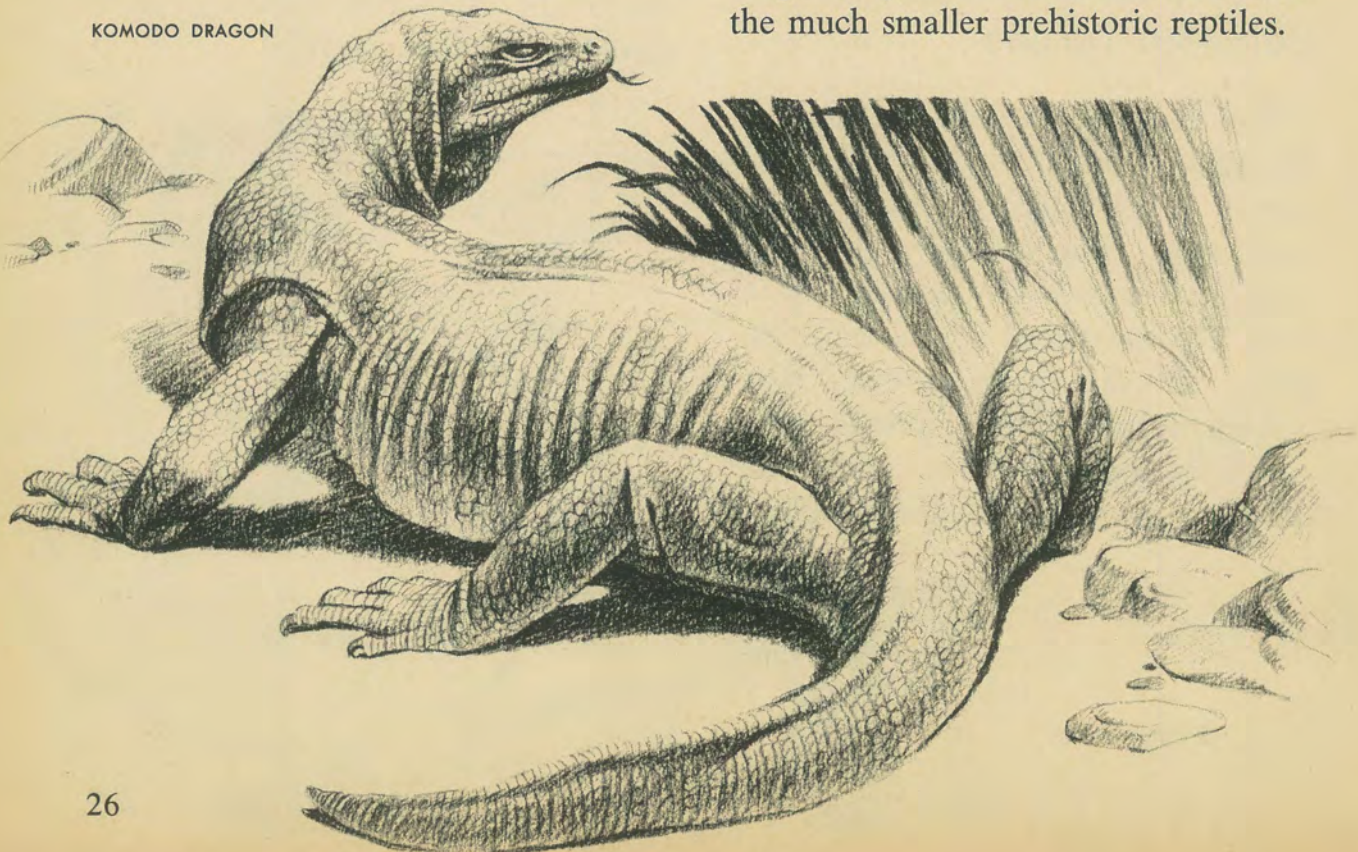
dinosaurs roamed the earth, there were many smaller reptiles clambering among the rocks at the feet of these giants. These smaller reptiles, which were the ancestors of our modern lizards, could easily hide from the "giants" and probably, in many instances, raided their nests and ate their eggs. It is possible that the smaller size of these early liz-

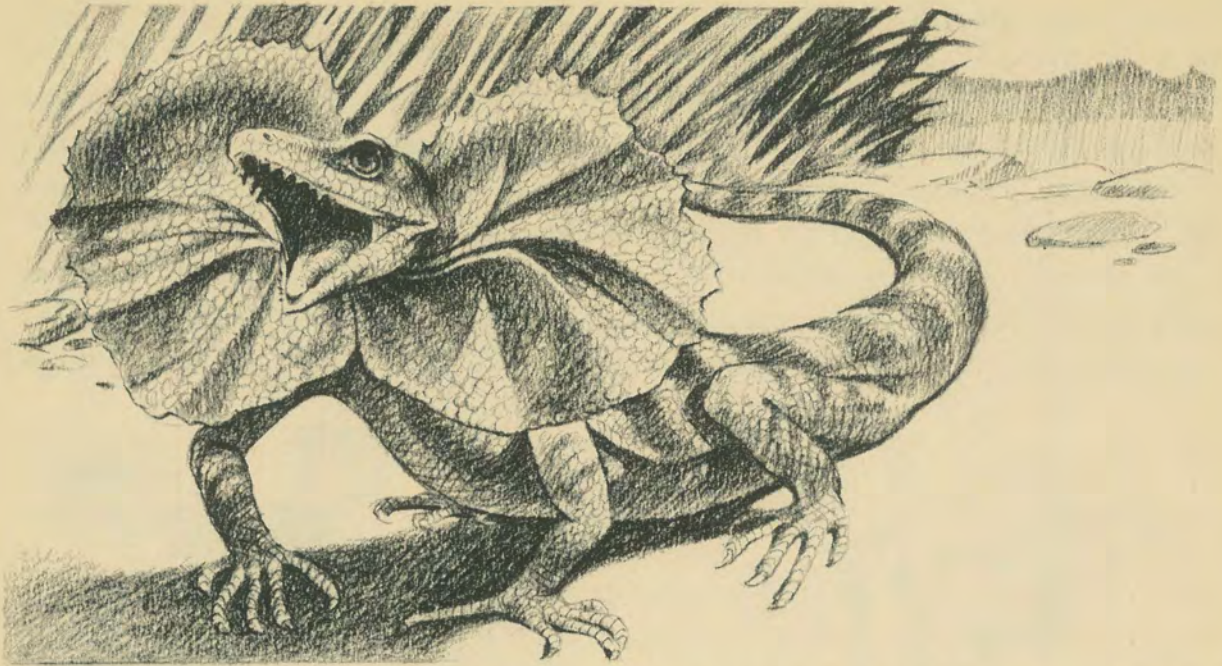
ards, and their lesser need for food, helped them to survive, while the giant dinosaurs died out.

Komodo Dragon

The largest of our modern lizards is the Komodo dragon, a ten-foot reptile which lives on the remote Komodo Islands in the Pacific Ocean. These lizards are so big that they can actually lift and carry away animals the size of a large dog. Many changes have taken place during the millions of years since the "age of reptiles," and the Komodo dragon may have descended from one of the much smaller prehistoric reptiles.

KOMODO DRAGON





The bearded lizard wears its "collar." When it is frightened, it extends the frills of skin around its neck.

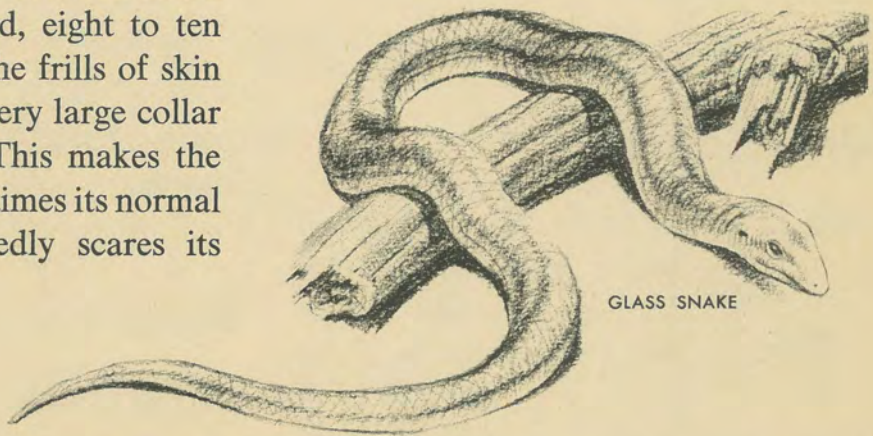
Bearded Lizard

Most present-day lizards are small, and many have unusual shapes. One of the most impressive species is the frilled or bearded lizard of Australia. This lizard, eight to ten inches long, will raise the frills of skin around its neck into a very large collar when it is frightened. This makes the head appear to be three times its normal size and this undoubtedly scares its enemies.

How does it frighten its enemies?

many have unusual shapes. One of the most impressive species is the frilled or bearded lizard

southeastern and central parts of the United States. Like many other lizards, they can break off their tails while being captured. This act is often a good defense, because the broken tail does not hurt the lizard and, as the tail lies wrig-



GLASS SNAKE

Glass Snake

This long, slender, legless reptile looks like a snake. However, it has both eyelids and ear openings, which are never found in snakes. Glass snakes can be found in the

How does the glass snake trick enemies?

like a snake. However, it has both eyelids and ear openings, which are never found in

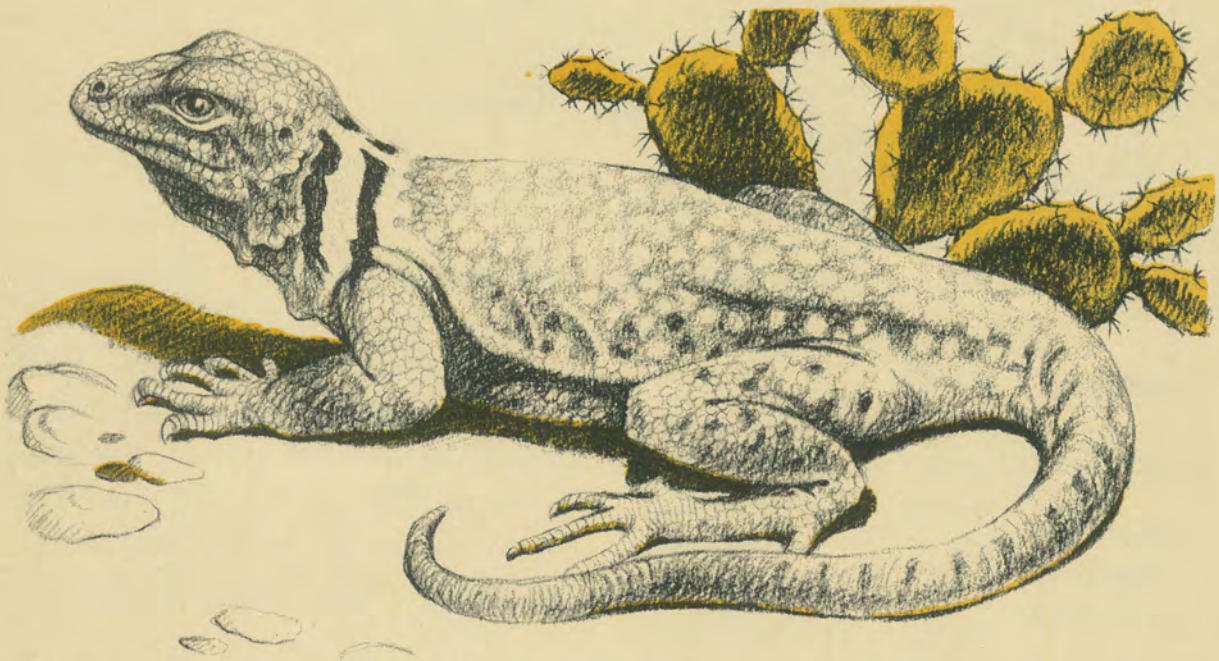
gling on the ground, it attracts the attention of the enemy. Meanwhile, the intact body of the lizard — minus the tail — crawls away to safety.

The snakelike appearance of these lizards and their extremely long tails are

probably responsible for the false stories about "disjointed snakes that will survive." In captivity, these lizards feed readily on insects, worms and small lizards. If care is taken when they are caught, the tail and body may remain in one piece. Broken tails cannot rejoin the body, but the glass snake will grow a new short tail.

their hind legs. The forelegs are folded under the body at this time. With a little imagination, we can picture from this pose what some of the giant reptiles must have looked like millions of years ago.

Collared lizards make their homes in rocky arid places in the southwestern United States. They feed mainly upon



The long-tailed, thin-necked collared lizards are numerous in rocky areas of the southwestern United States.

Collared Lizard

If taken into captivity, these lizards soon refuse food and die. It is far wiser to study this lizard, which is ten to fifteen inch long, in the field.

How does it get its name?

Their name comes from the black or deep brown collar that girdles the neck. They are attractive but very nervous, and will usually bite if handled. If alarmed, they will race away on all four feet, lift the tail and forward part of the body off the ground, and run swiftly on

insects, but will also catch and eat small lizards.

Fence Lizards

The name "fence lizard" was given to these small spiny reptiles because they are often seen clambering over the stone and wooden fences that mark the boundaries of farms. Like most other small lizards, they will bite when first

Why do they bob their bodies up and down?



Fence lizards, along with spiny and scaly lizards, are known as swifts.

captured. However, the "bite" is more accurately a pinch as they cannot exert enough pressure to drive their small teeth into the skin. Soon after capture they tame down. The males are more brilliantly colored than the females and will sometimes bob their bodies up and down in a fashion that displays these bright colors. These movements are used both to frighten away other males and to attract a mate.

There are about thirty different kinds throughout the United States from the Atlantic to the Pacific, with the exception of the northern tier of states. They feed upon worms, insects and spiders. In captivity, their favorite food is the mealworm.

A five-lined skink of the eastern U. S. laying eggs.



Skinks

Skinks are smooth waxy-looking lizards that usually live close to the ground. They have relatively short legs, long bodies and tails, and some kinds are very snake-like. The smaller species cannot hurt when they bite, but some of the larger kinds can inflict a painful pinch. It takes an alert hunter to catch them, because they quickly disappear either down the burrows they have dug or between the rocks and debris on the woodland floor. They are often found in moist, decaying logs.

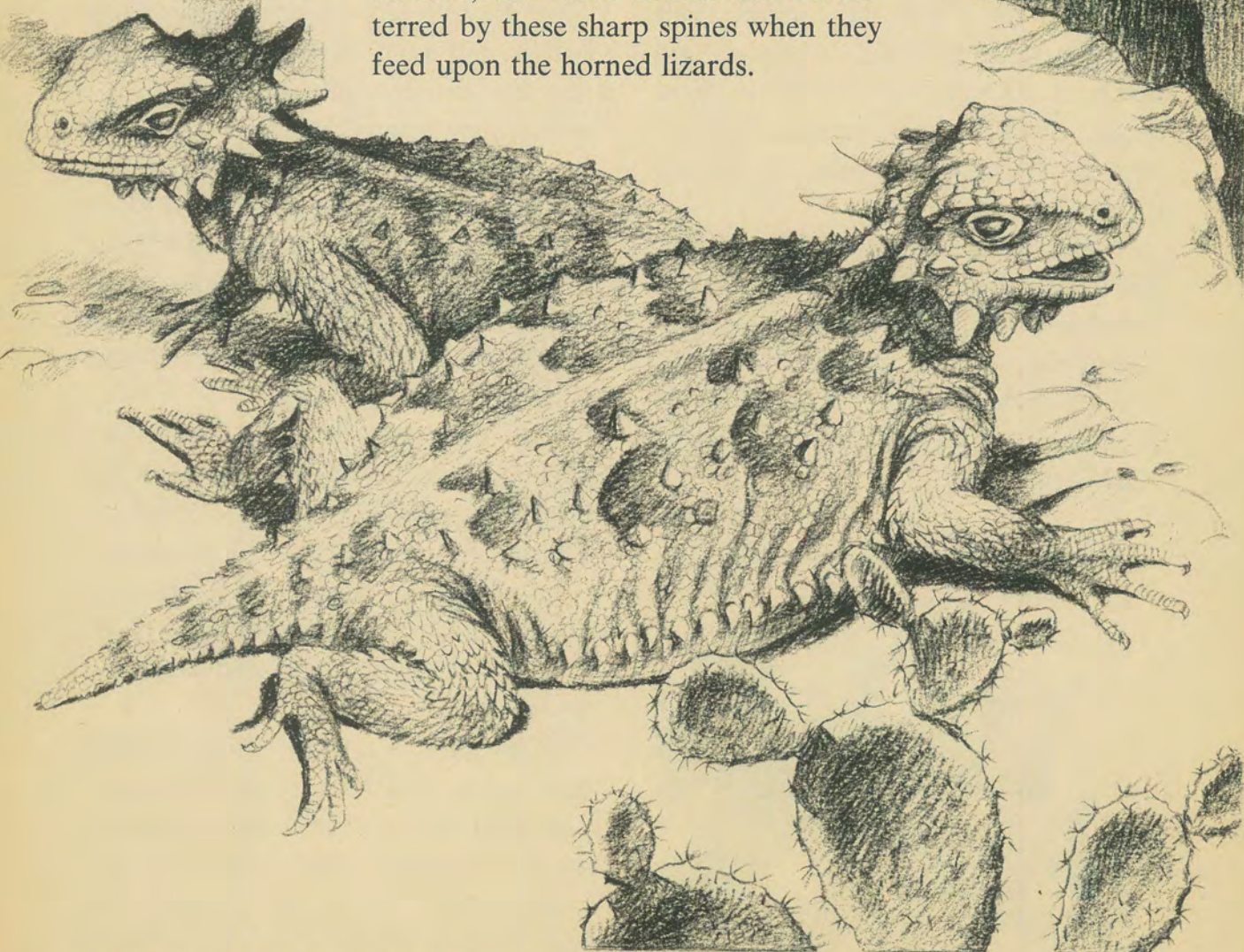
They feed mainly upon insects, but larger specimens capture baby mice and birds. In captivity, they are long-lived if provided with plenty of moisture and a good hiding place. After they become tame, they may even take food — including mealworms and beetles — by hand.

Some species are brilliantly colored with stripes and have bright blue tails. The northern prairie skink, found in the north central states, has bright red cheek patches during the breeding season. Fifteen different kinds are found in the United States.

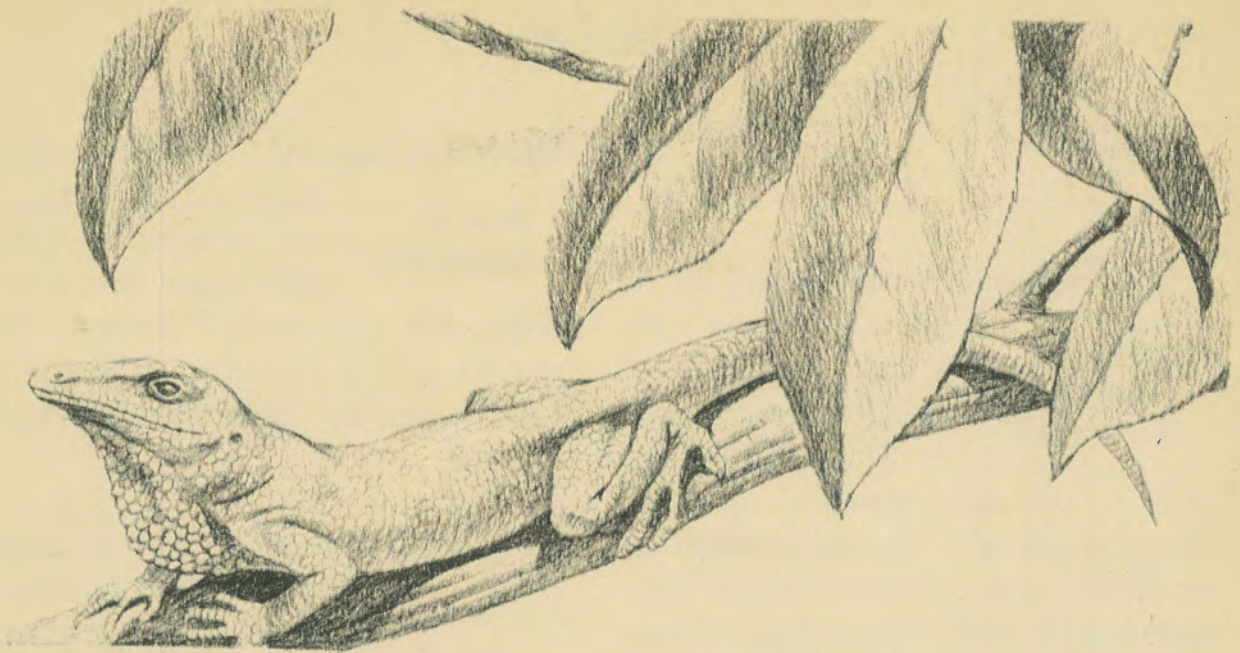
Horned Lizards

These curious lizards, sometimes called horned toads, are found in the middle and southwestern United States. Perhaps their flat, squat bodies, short stubby legs, and their sitting posture, caused the early naturalists to call them "horned toads." The presence of body scales immediately identifies them as reptiles. The long hornlike spines on head and body are probably a form of protection. However, hawks, owls, road-runners, and other lizards are not deterred by these sharp spines when they feed upon the horned lizards.

Why are they called horned toads?



Horned lizards include such species as the short-horned lizard, desert horned lizard and Texas horned lizard.



The word *chameleon* comes from words meaning "ground lion." The American chameleon is also called an anole.

When danger threatens, these lizards will quickly bury themselves in loose sand or will puff up their bodies until they are almost twice their normal size. They also have the strange habit of squirting blood from the forward corners of the eyes, sometimes to a distance of several feet.

If kept at temperatures above 70 degrees Fahrenheit, they make good pets and will readily eat ants and other soft-bodied insects.

American Chameleon

This small, interesting lizard can change its body color. It reaches about six to seven inches in length and is found in the southeastern United States.

Under the lizard's skin are a number of tiny cells which are branched. They look like tiny trees. These cells contain a pigment (color). When the lizard is excited, frightened, suddenly cooled or heated, or moved into the light or dark, the pigments move to different places in the branches of the cells. If they move toward the surface of the skin, one color is dominant, or stands out. If they move away from the surface, another color is dominant. In this way, the lizard's color can change from dark brown to light green. During courtship and sometimes when the lizard is excited, it will extend a fold of bright red skin at its throat. The toes of this lizard, like those of the geckos, have adhesive-like tips which enable the toes to adhere to smooth surfaces. These small lizards make interesting pets, and readily feed upon mealworms and other small insects.

Snakes



The temperature of warm-blooded animals is always constant, because it is made by the animal's body. The snakes, as

Where do snakes spend the winter?

well as all other reptiles, are cold-blooded animals. The temperature of their bodies is controlled by the temperature of their surroundings. Those kinds that live in the temperate zones, where the winters are severe, find places beneath the ground or in the mud at the bottom of ponds, where the temperature never falls below freezing. Here they spend the winter in a deep "sleep" (hibernation). We do not find reptiles in the cold areas of the Arctic and the Antarctic.

The reptiles that live in tropical countries, where the temperature is often very high, seek hiding places and wait (estivate) for the heat to pass.

Snakes are different from other reptiles in that they have no eyelids or ears. To hear, they sense the vibrations that are carried through the ground, and to protect their eyes they have transparent "caps" through which they see.

How do snakes hear?

When a snake needs to shed its outer layer of skin, it usually picks a quiet, protected spot. There it lies still for a few days while a

How does a snake shed its skin?

special oily substance flows between the under layer of skin and the old outer skin, and then hardens. Then the snake moves about to find a rough log or stone upon which it rubs its head to loosen the skin at the edges of its lips. By catching the loose skin on a rough spot, it can crawl out of the old skin in about the same way that we might remove a pair of gloves from our hands — by simply turning them inside out.



This rattlesnake catches its loose skin on a cactus plant in order to shed.

King Snake

King snakes are found in most parts of the United States. Their name was probably derived from the fact that they feed upon other snakes, even the poisonous ones. They kill by constriction and are believed to be partially free from the poisonous effects of venomous reptiles. Besides eating other snakes, they feed on rodents, lizards, insects and birds, as well as the eggs of birds. They live in many habitats, but the greater majority seek the woodlands, finding shelter in rotting stumps, under the loose bark of fallen trees, and among rocks and leaves.

They are easily managed in captivity and can be handled freely. However, all reptiles have individual temperaments, so some king snakes never tame down. Collecting some of the brilliantly colored king snakes should be done with

What do they eat?

How do king snakes differ from coral snakes?

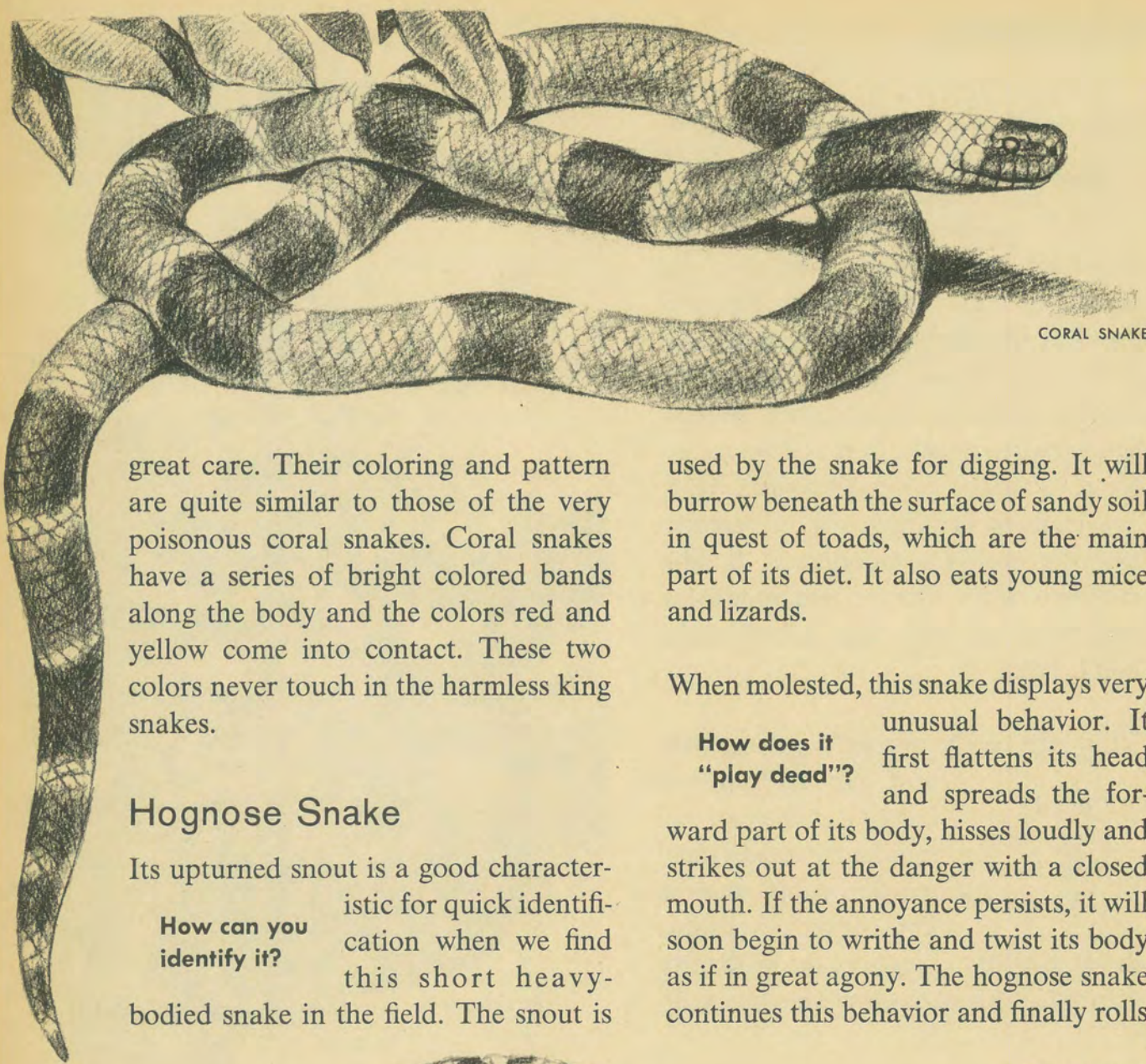
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KING SNAKE



Reptiles Sec. 3
-70 69 68 67 66 65



CORAL SNAKE

great care. Their coloring and pattern are quite similar to those of the very poisonous coral snakes. Coral snakes have a series of bright colored bands along the body and the colors red and yellow come into contact. These two colors never touch in the harmless king snakes.

Hognose Snake

Its upturned snout is a good characteristic for quick identification when we find this short heavy-bodied snake in the field. The snout is

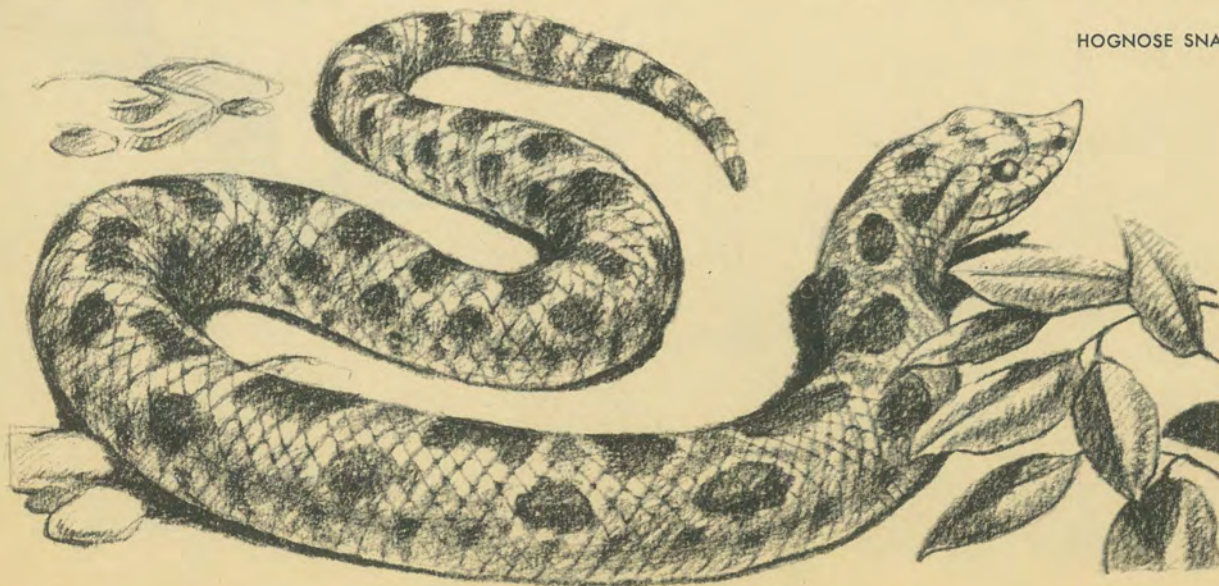
How can you identify it?

used by the snake for digging. It will burrow beneath the surface of sandy soil in quest of toads, which are the main part of its diet. It also eats young mice and lizards.

When molested, this snake displays very unusual behavior. It first flattens its head and spreads the forward part of its body, hisses loudly and strikes out at the danger with a closed mouth. If the annoyance persists, it will soon begin to writhe and twist its body as if in great agony. The hognose snake continues this behavior and finally rolls

How does it "play dead"?

unusual behavior. It first flattens its head and spreads the forward part of its body, hisses loudly and strikes out at the danger with a closed mouth.



HOGNOSE SNAKE

over on its back, suddenly ceasing all motion. In this condition, it can be prodded without response. However, if we roll it over, right side up, it will immediately roll over onto its back again. Perhaps this snake believes that the only way to act like a dead snake is to lie upside down. They make interesting pets, and once these snakes feel perfectly safe, they will stop "playing dead." It is necessary to have toads available as a food supply for them.

Garter Snakes

Every state in the United States has its populations of garter snakes. These common snakes, which are eighteen to thirty inches in length, are known to every young boy who has spent any time in the field. They can be found in vacant lots, backyards and even city parks. They have a preference for moist places, because there they find their food which consists of worms,

Why do they give off a vile-smelling body fluid?

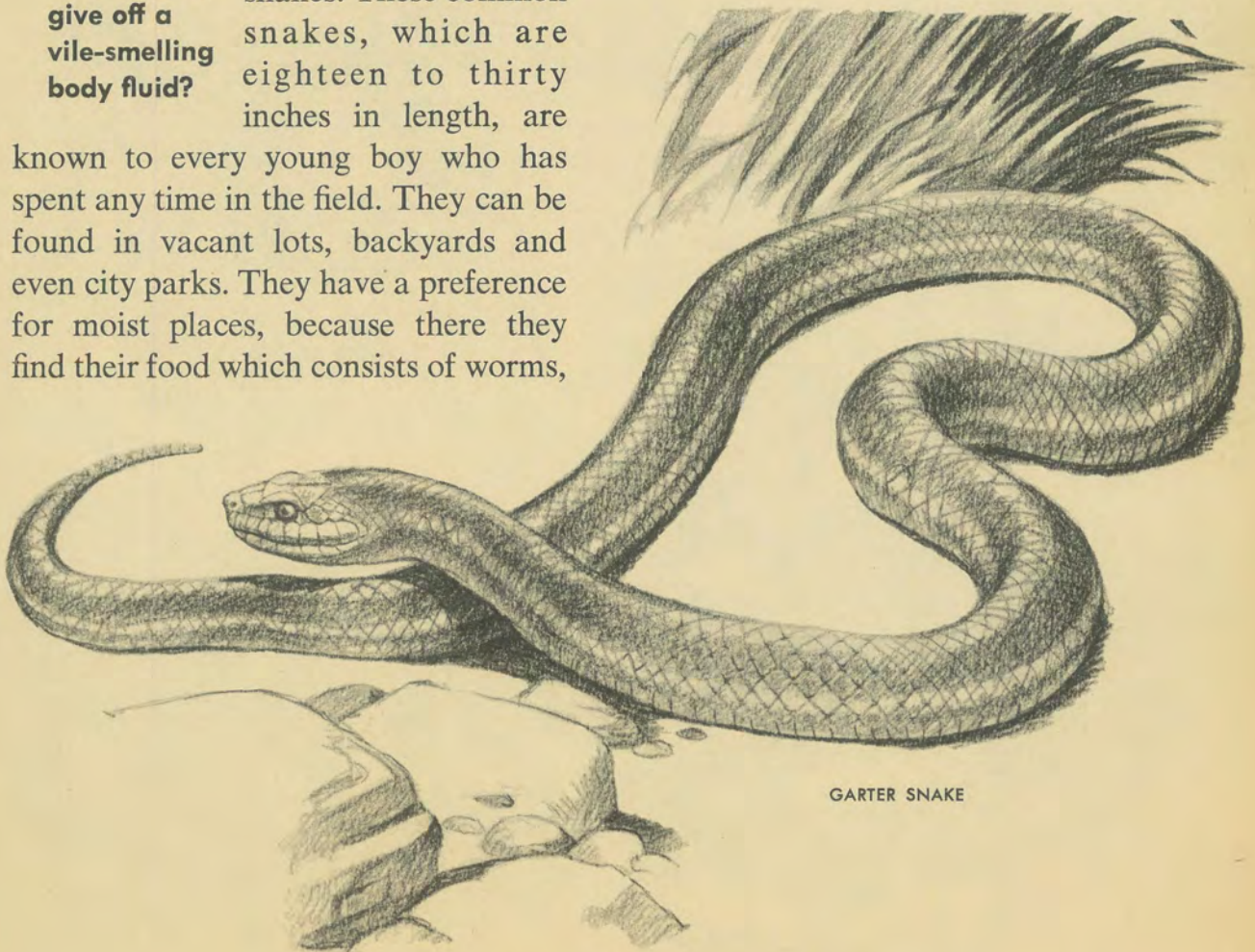
populations of garter snakes. These common snakes, which are eighteen to thirty inches in length, are

salamanders, fish and frogs. Young garter snakes will feed readily on insects. When these reptiles are first captured they will give off a vile-smelling fluid from glands at the base of the tail. The odor of this fluid probably repels their enemies. This habit stops as soon as they become tame.

Garter snakes are extremely easy to keep, because they can often be induced to take small pieces of meat and fish as a substitute diet. Care should be taken that large females are put into tight cages. A single female can give birth to as many as fifty or more

How many young can a female garter snake have?

keep, because they can often be induced to take small pieces of meat and fish as a substitute diet. Care



GARTER SNAKE



COPPERHEAD



TIMBER RATTLESNAKE



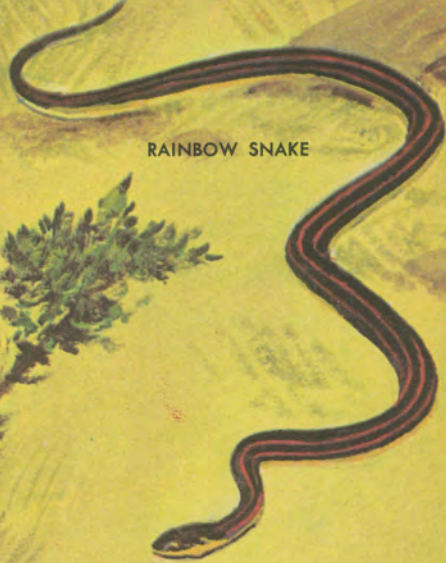
WESTERN DIAMONDBACK RATTLESNAKE



QUEEN SNAKE



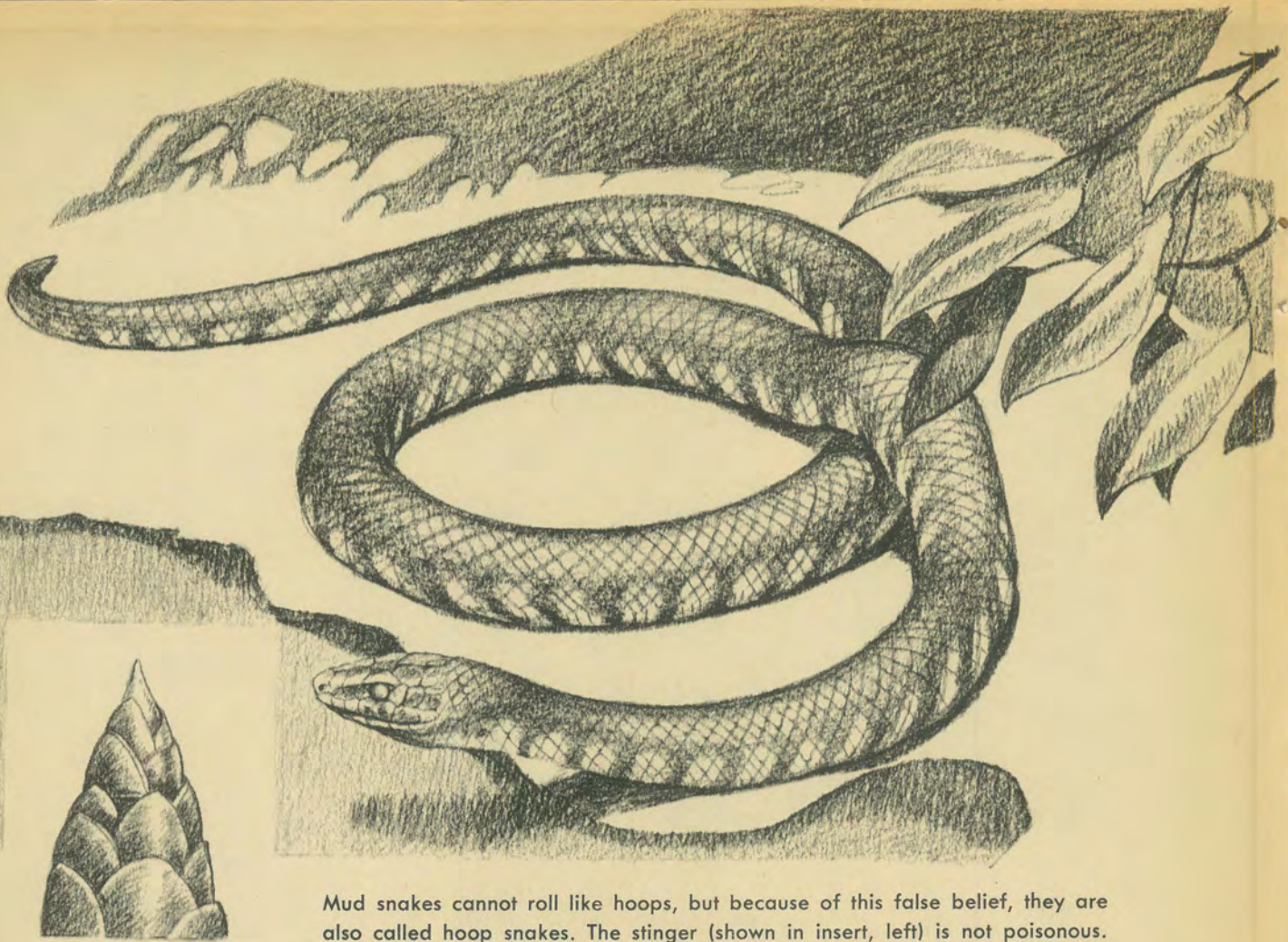
WATER MOCCASIN



RAINBOW SNAKE



CORN SNAKE



Mud snakes cannot roll like hoops, but because of this false belief, they are also called hoop snakes. The stinger (shown in insert, left) is not poisonous.

four-to-five-inch young. The name of this snake undoubtedly comes from its ribbon-like pattern, which is similar to that on the ribbon garters used by men.

Mud Snake

These long blue-black snakes are found in the southeastern part of the United States, and are four to six feet long. They are docile and can easily be tamed. They live along the fresh-water canals and swamps where they catch fish and large salamanders for food. The bright red patches of color on the sides and underparts of the body are in strong contrast to the black ground color.

However, the snake is not easily discovered, because it usually hides in the muddy water when molested. The tail terminates in a sharp spine-like tip. When handled, this harmless tip will often scratch across the skin. This has caused many false stories to be told about the mud snake, such as: "It stings you with the end of its 'poisonous' tail"; "It can take its tail into its mouth and roll like a hoop." Both stories are not true, of course.

**Can it
roll like
a hoop?**

In captivity, these snakes should be provided with plenty of water. An aquarium tank, partially filled, makes an adequate cage. A large rock should be provided so that the snake can get up out of the water when necessary.

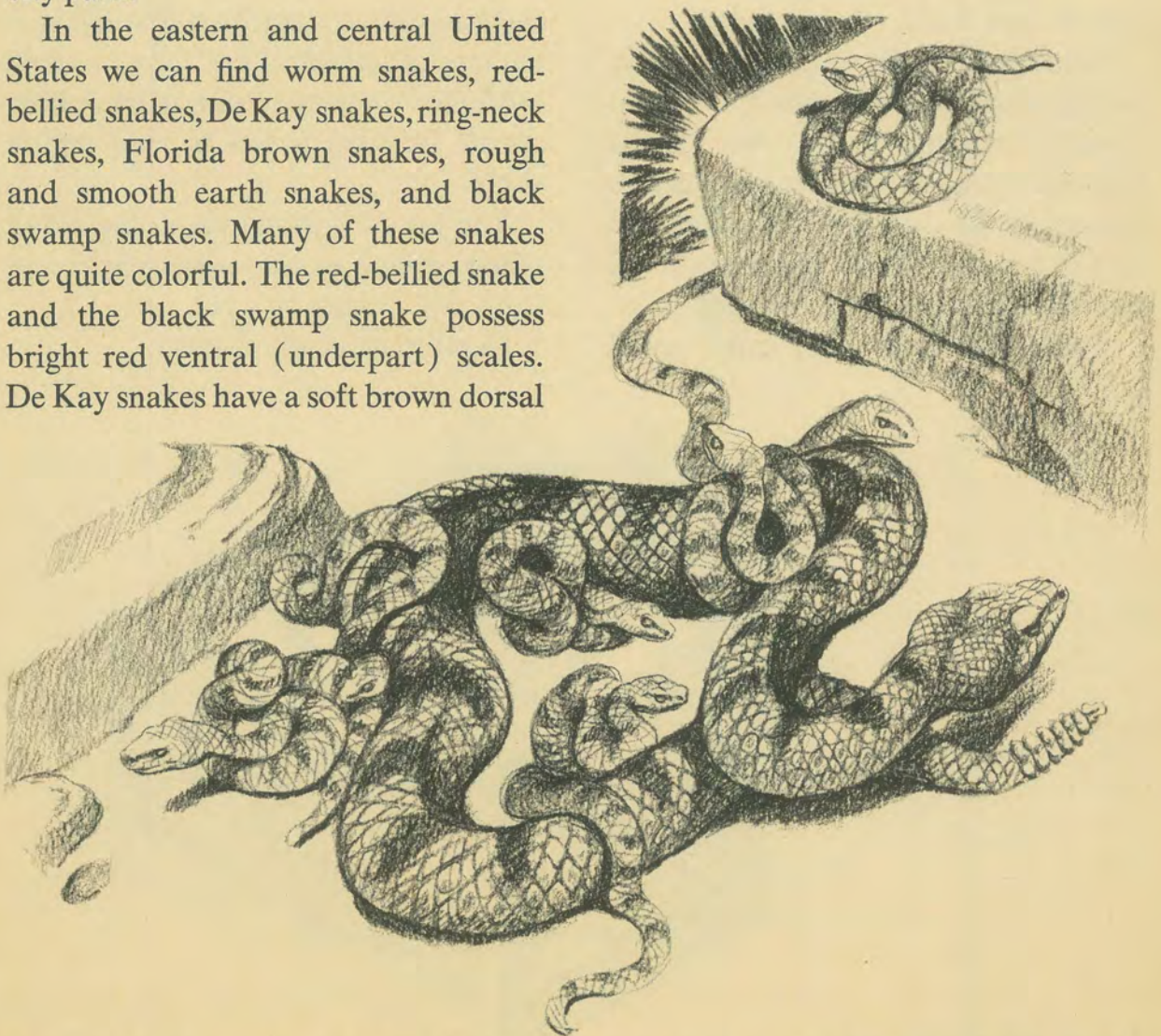
Small Snakes

Twelve inches and under is the adult size of many snakes that live in the United States. The smaller varieties are as interesting and striking in appearance as many of the larger forms, and often they can be found close to human habitation. We can discover these reptiles by carefully turning over rocks, leaves and rotting wood that lie on the ground in a vacant lot, field or remote corner of the city park.

In the eastern and central United States we can find worm snakes, red-bellied snakes, De Kay snakes, ring-neck snakes, Florida brown snakes, rough and smooth earth snakes, and black swamp snakes. Many of these snakes are quite colorful. The red-bellied snake and the black swamp snake possess bright red ventral (underpart) scales. De Kay snakes have a soft brown dorsal

(upper) surface. When the animal is disturbed and puffs up its body, the dorsal surface turns into a checkerboard pattern. The ring-neck snake has a striking color and pattern. The undersides are either a bright red or orange red, the back is a glossy blue-gray, and about the neck there is a collar of bright yellow. There are also many small species in the western part of the United States.

All small snakes feed upon insects, worms, small salamanders and fish, and they can be easily tamed and kept for study in your own home "zoo."



Pictured above is a den of rattlers. Rattlesnakes are born alive and a litter of about one dozen is common.

How to Keep Reptiles

The most important thing in caring for wild animals is cleanliness. The cages have to be kept spotlessly clean and each animal needs plenty of fresh drinking water. Aquatic turtles and alligators can be kept in aquarium tanks which hold about one or two inches of water. A couple of large flat stones are needed, so that the animals can climb up out of the water. Clean these tanks at least twice a week and always be sure that the new water is the same temperature as that which was removed.

Feed the reptiles once a week by putting small pieces of raw fish or meat directly onto the stones. Any of the food not eaten has to be removed before the end of the day. Both alligators and turtles grasp the food and carry it off into the water before swallowing it.

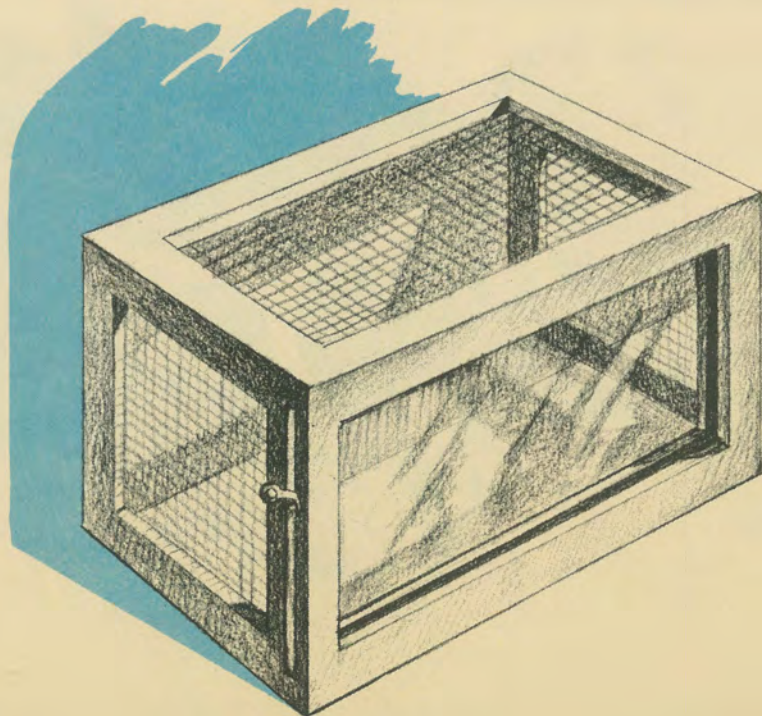
Cages in which sand, earth, small

cactus plants and other natural decorations are placed do look natural. However, it is difficult to keep this type of cage clean and it is not long before disease establishes itself. The best place to keep lizards, snakes and land turtles is in a small, simple, well-ventilated cage which is painted with a hard, glossy enamel paint. Such cages are easy to keep clean and dry.

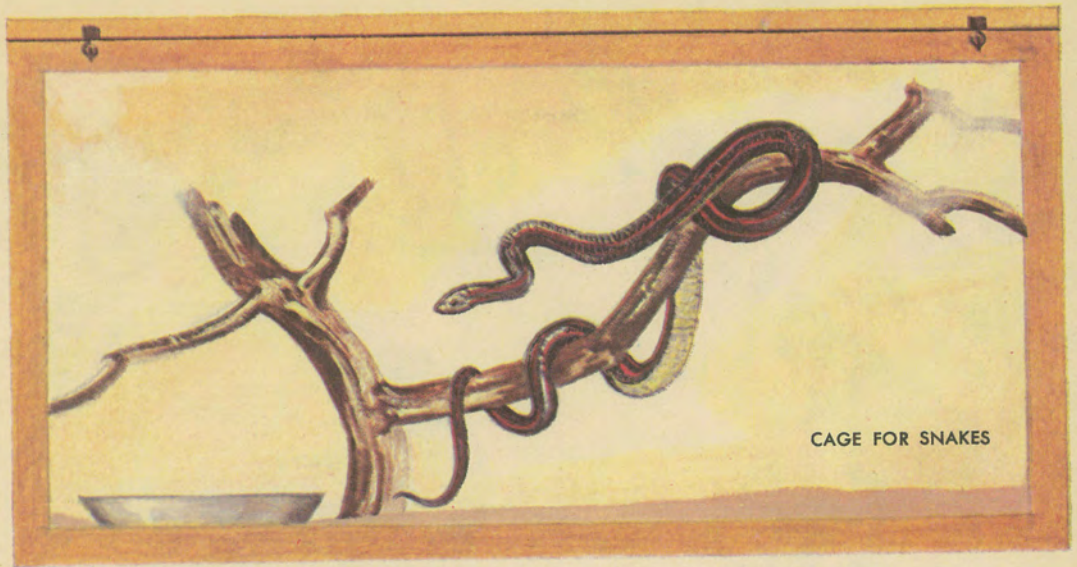
The only foreign object that should be put into a reptile cage, besides a drinking dish, is something that will give the reptile a place to hide. An inverted cardboard shoe box, with a small hole cut in the side, makes a good reptile home.

The joy of learning about the living things around us can come from keeping a wild animal as a pet.

Reptiles make good pets.



A simple, well-ventilated cage is the best home for your reptile.



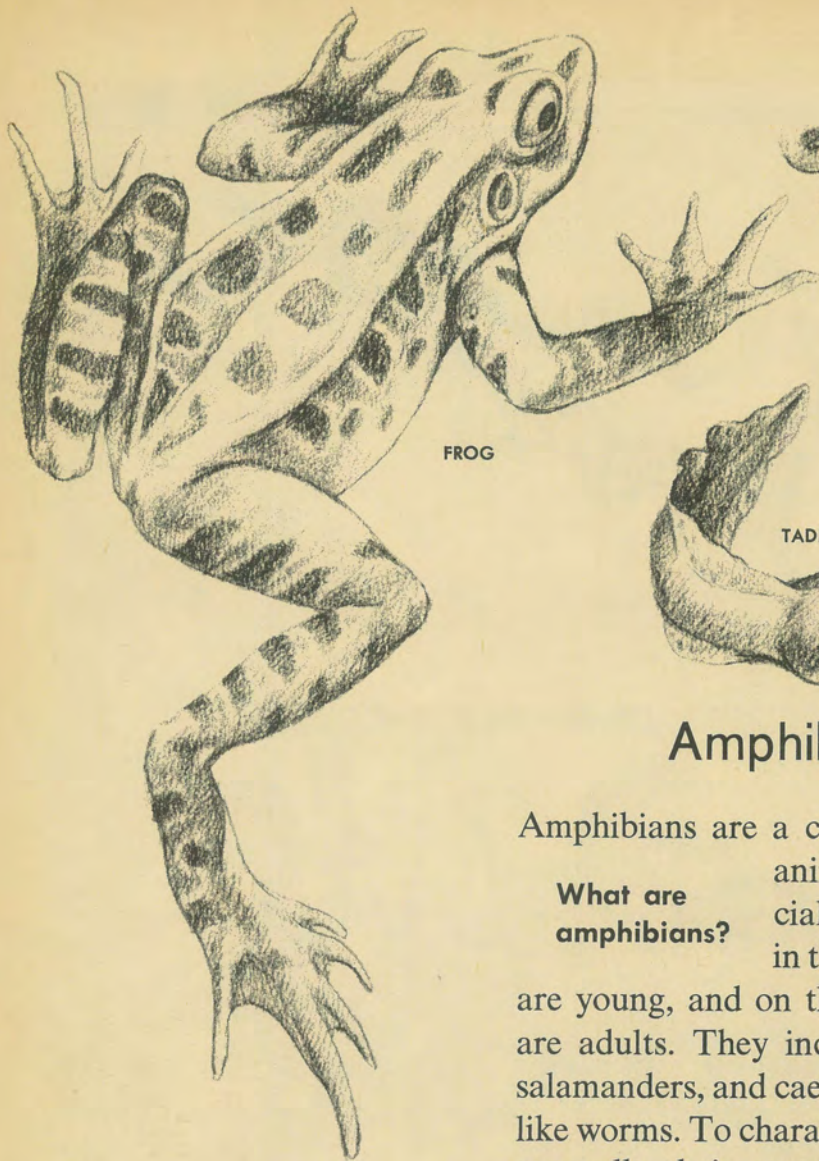
CAGE FOR SNAKES



CAGE FOR SEMI-AQUATIC SPECIMENS



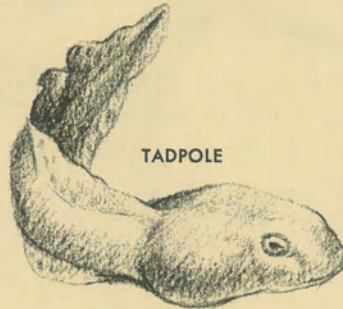
CAGE FOR LIZARDS



FROG



FROG'S EGGS



TADPOLE

Amphibians

Amphibians are a class of backboneed animals which are specially adapted for life in the water when they are young, and on the land when they are adults. They include frogs, toads, salamanders, and caecilians, which look like worms. To characterize amphibians generally, their young breathe by means of gills and as adults, usually have lungs. They are cold-blooded and are found in warm climates. Almost all are less than three feet long. Most have four legs as adults and they usually lay their eggs in water. Their skin is smooth, moist and without scales.

What are amphibians?



FOOT OF LIZARD



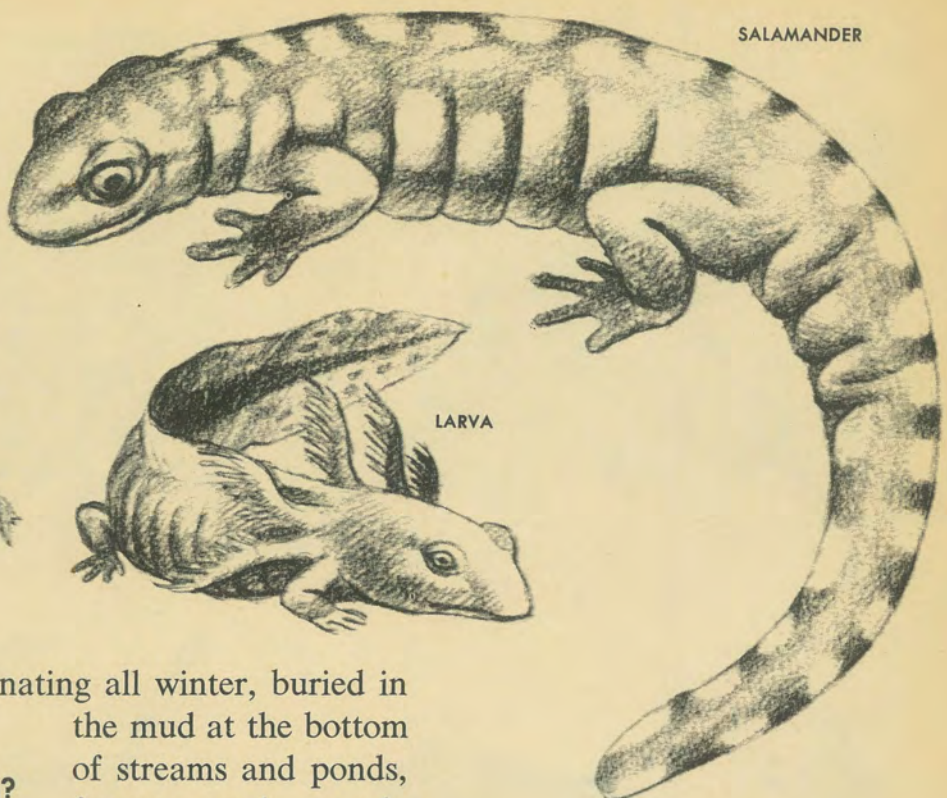
FOREFOOT OF FROG



FOREFOOT OF SALAMANDER



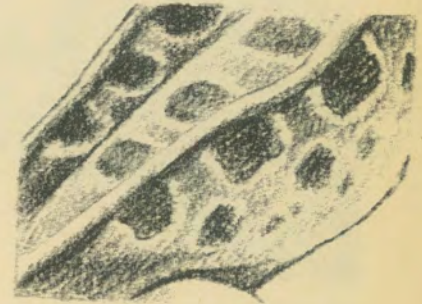
EGGS OF SALAMANDER



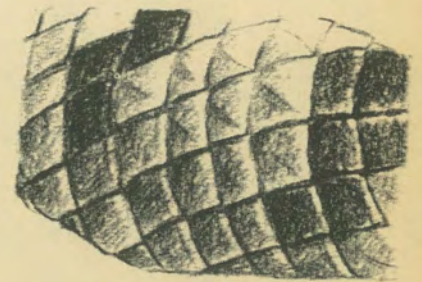
SALAMANDER

LARVA

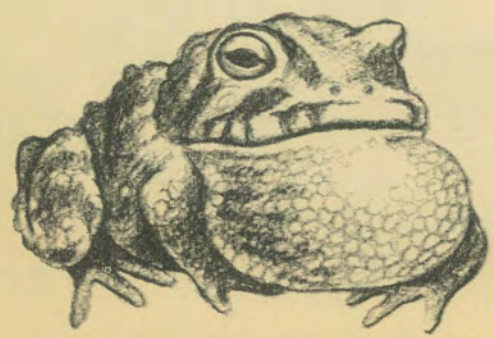
After hibernating all winter, buried in the mud at the bottom of streams and ponds, frogs and toads emerge in the spring to renew their life cycle. The females lay eggs in a jelly-like mass, attaching them to twigs, grass, or stones in shallow water. In a short time — from a few days to a few weeks, depending on the kind of amphibian and the temperature of the water — the eggs hatch into tadpoles or larvae. These tiny creatures are completely on their own and soon learn to nibble at small water plants and hide from their enemies. Eventually, the tadpole's gills disappear, its tail shrinks, and it begins to grow legs.



SKIN OF FROG



SKIN OF LIZARD



TOAD CALLING



HOW TOAD CATCHES PREY



GREEN FROG



BULLFROG



BARKING FROG



GREEN TREE FROG



CRICKET FROG



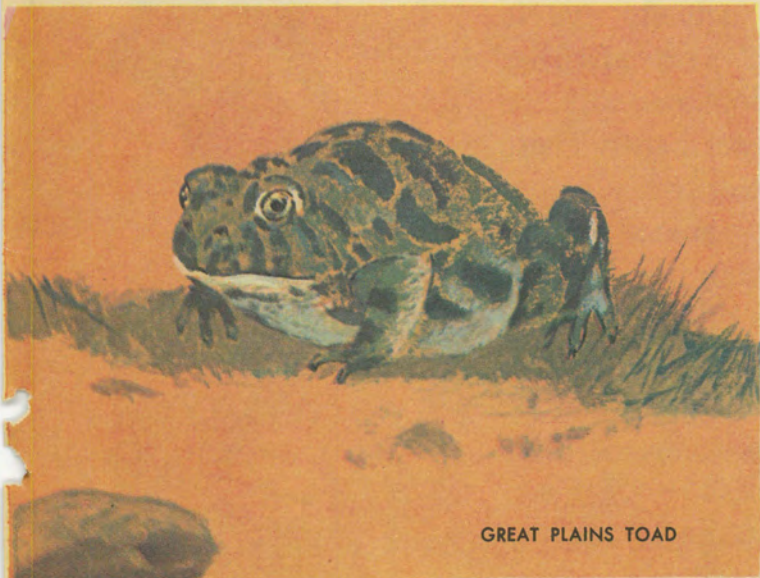
RED-LEGGED FROG



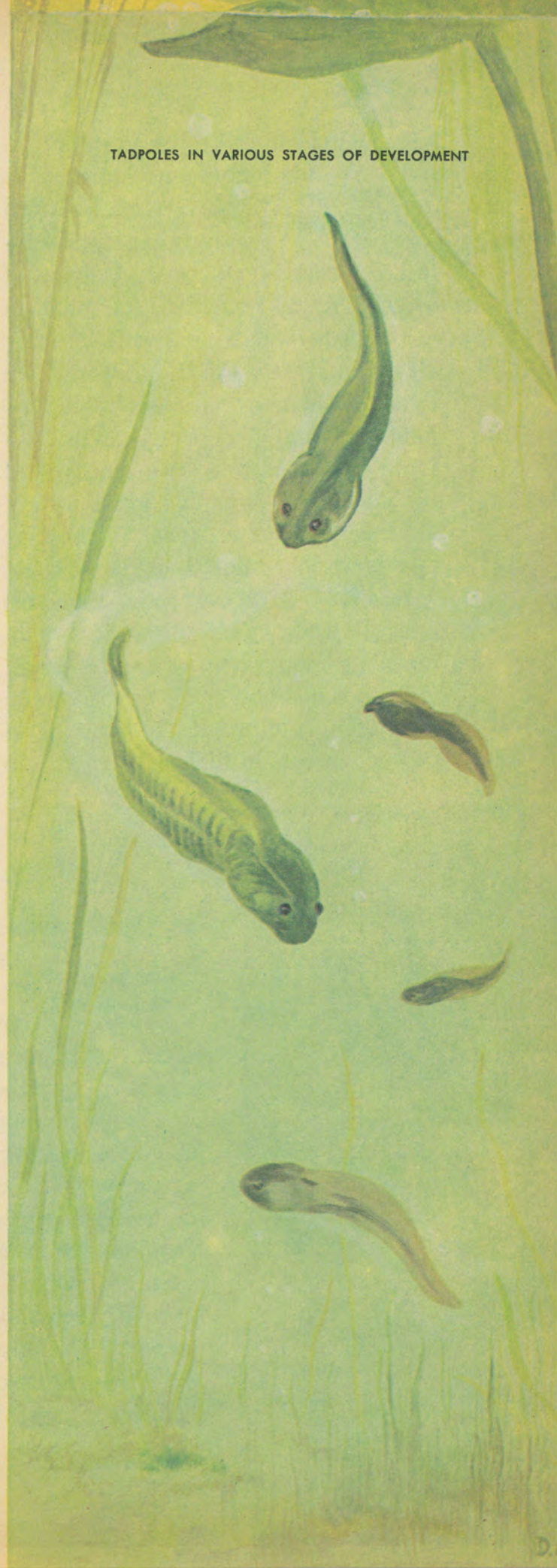
NARROW-MOUTHED TOAD



AMERICAN TOAD



GREAT PLAINS TOAD



TADPOLES IN VARIOUS STAGES OF DEVELOPMENT

Wood Frog

Like many wild creatures, frogs are endowed with protective colors which blend with their natural habitat. For example, the wood frog is soft brown like the leaves and leaf mold in the woods where it lives. Looking closely at the wood frog, we can see other interesting characteristics. Its hind legs, long and strong, allow it to jump many times its own length, and the wood frog turns in mid-air to face its enemy when it lands. Its bulging eyes are bright-colored, like jewels, but it sees moving objects better than still ones. Its wide mouth allows it to gulp down its food whole — smaller frogs, worms, snails and small fish. Its long, sticky tongue flips out like lightning to capture insects in flight.

What does it look like?



Wood frogs lay a mass of 2,000 to 3,000 eggs.

SPRING PEPPER



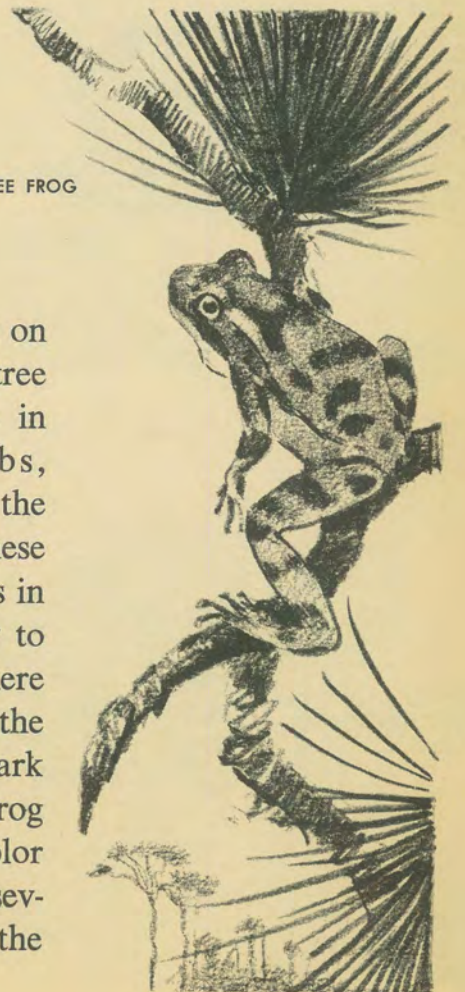
PINE TREE FROG

Tree Frogs

We usually think of frogs jumping on the ground, but tree frogs actually live in trees and shrubs,

Can frogs climb trees?

where they cling to branches with the help of sticky pads on their toes. These little frogs, no more than two inches in length, leave their airy homes only to lay their eggs at breeding time. There are several species in addition to the common tree frog, which has a dark patch on its back. The green tree frog is bright green and can change its color quickly. The Canyon tree frog has several round spots on its back, and the Pacific tree frog is striped.



Spadefoot Toad

It is difficult to distinguish between toads and frogs until we remember that toads have a rough or warty skin, that they are more plump and move more slowly than frogs, and that they do not always live near water. It is not true, of course, that toads will cause warts if you handle them, but when they are in danger their skin sometimes exudes a milky fluid. Most toads burrow into the ground, and the spadefoot toad is especially well

**Do toads
cause warts?**

toads and frogs until
we remember that
toads have a rough or



The spadefoot leaves its burrow at night to feed.

Newts

Of all the salamanders — and there are more than a hundred different kinds in the United States — the newt has the most interesting life cycle. Its eggs, similar to those of the frog, are deposited on leaves and stems of water plants. After hatching, the larvae live for three or four months in the water and then come out onto dry land. It is now bright orange in color with red spots circled in black on its back. After spending two or three years on land and growing to three or four inches in length, it returns to water for the rest of its life. The adults of the eastern newts then change color and develop a broad swimming tail which helps them move about.

**What is
the newt's
life cycle?**

more than a hundred
different kinds in the
United States — the
newt has the most inter-

Blind Salamanders

A great variety of salamanders is to be found in various parts of the United States. Among the aquatic species are the mud puppy, hell-bender and Congo eel. Some salamanders have names descriptive of their color or markings: green, purple, red, painted, tiger, mottled and marbled.

**Why is it
called "blind"?**

found in various
parts of the United
States. Among the

Salamanders are not as commonly seen as frogs and toads, because many of them come out only at night and all of them avoid the sun. One species, the blind salamander, usually lives in caves, and its eyes are either very small or undeveloped. Because it lives in darkness, its skin is pale yellow or white. These salamanders are found in the Ozarks, Georgia and Texas.



MUD PUPPY

SLIMY SALAMANDER

RED SALAMANDER

ALLIGATOR SALAMANDER

YELLOW SPOTTED SALAMANDER

PAINTED SALAMANDER



DEVELOPMENT OF NEWT